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ABSTRACT

A handbook to help teaching assistants (TAs) define and implement teaching goals and to present materials effectively is presented as part of the Teaching Assistant Development Program at the University of California at San Diego. A checklist gives 20 skills that a TA needs to develop to be a good teacher. Behavioral learning goals and process goals are considered, and exercises are provided to help the TA identify teaching goals. Additional contents include: a teaching objectives planning sheet; an exercise to help students think systematically and creatively; a list of teaching strategies to develop organized thinking and creativity; suggestions for leading student discussions; ideas to encourage student participation; ways to respond to students' ideas productively; how to present material effectively in lectures; 13 alternative classroom formats (e.g., census-taking, brainstorming, peer group teaching, discovery format, role playing); suggestions on how to get good feedback on teaching; information on what to do when students need additional help; Teaching Activity Profiles for Section TAs and Laboratory TAs; and a Self-Assessment Questionnaire for Students. (SW)

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The materials in the Special Collection on the Training of Teaching Assistants were developed through the active efforts of numerous educators who first met at the 1986 National Conference on the Institutional Responsibilities and Responses in the Employment and Education of Teaching Assistants held at the Ohio State University. Assisted by more than 80 individuals, the committee chairs listed below were able to establish the collection which will be developed and maintained by the ERIC Clearinghouse for Higher Education. This arrangement will enable faculty members, faculty developers, administrators, TA supervisors, and graduate teaching assistants to have access to TA training materials produced by institutions across the nation.

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TEACHING ASSISTANCE

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The TADP was established by the University of California to help graduate students in their professional preparation and to improve undergraduate instruction.

In addition to this handbook, which is introduced in more detail on the following page, the Program offers a number of services. These are designed to help you in planning your teaching, in learning about and implementing effective teaching techniques, and in getting useful information about how well you are achieving your goals.

The services offered by TADP are:

- Individual consultation for planning or solving problems.
- Workshops in which you can:
  - Learn about teaching methods
  - View videotaped samples of various teaching styles
  - Practice new teaching techniques through simulation
  - Share problems and solutions with fellow TA's
- Feedback through videotaping, student questionnaires, classroom observation, and other methods.

Your discussions with TADP staff, and any information collected, are solely for your teaching improvement and will not be communicated to anyone else except at your request.

INTRODUCTION

In this handbook, we want to help you define and implement your own teaching goals. Each decision you make in the classroom has certain consequences and making it excludes other possibilities. If you decide to encourage discussion of a new topic which has just arisen, you must abandon the topic you had thought to suggest. If you help one student who is struggling with a difficult concept, you may lose others who are ready to move on. Thus it is essential to set priorities and to know the effects of using a particular approach. "If I do this, what will happen?" is the question we address throughout.

We think you have a lot to do with the results of your teaching--that you can stimulate exciting discussions, improve the clarity of your explanations, find ways to reach quiet students, or help students think through problems for themselves, by choosing productive teaching strategies. What goes on in a class is simply communication, and most of the painful or embarrassing situations that arise are due to a failure in communication. By showing you the way we think communication works in the classroom, by suggesting new ways of communicating, and by providing a variety of formats through which to do this, we think we can help you to teach better and enjoy it more.

In teaching, as with any complex activity, you need a coordinated set of strategies in order to be effective. Setting up a good class is somewhat like cooking a meal. You need all the ingredients in a happy blend in order to get the flavor right, and too much or too little of something can affect the entire mixture. For this reason we are wary about suggesting any one tactic as "the" formula for good teaching; any of the suggestions included here, if used out of context, could be quite unproductive.

It is useful to look at differences in teaching situations as differences in *emphasis* on various activities. While there are typical differences among disciplines in how TA's handle classes or labs, *every* TA or teacher needs to have various teaching styles at his or her command because different aspects of the subject matter or different objectives within a course call for different approaches. Then, too, some typical ways of handling given subjects are more a matter of habit or tradition than of inevitable "rightness." In such cases widening the range of possibilities (see Section VII, on Alternative Formats, for example) will make your teaching more effective and interesting for both you and the students.

For these reasons, we hope that when you encounter various suggested teaching styles, formats, or ways of communicating with students in the material that follows, you will suspend any thoughts that "this is irrelevant to me" until you have seen the whole picture and considered the possibilities that lie outside the traditional, often stereotyped ways of teaching particular subjects. We think teaching and learning will be more effective as well as more exciting if you let this happen.

As you read our suggestions, you will find that in general we think of teaching (or better put, teaching-learning) as an active exchange among people; the one-way transmittal of information is only a small part of the process. We think that part of your responsibility as a teacher is knowing to *whom* you are transmitting information: what they are ready to hear and assimilate, the optimum pace of providing information, what they are apt to be excited about, and how they feel about their own intellectual abilities and limitations.

A second major theme is that the effective learner is *active* in selecting, organizing, and using information. The person with a photographic memory, who passively duplicates the information presented, is not our ideal learner; nor is the "student stenographer" who hears or reads, and then writes notes without doing anything productive in between. Thus many of our suggestions are implicitly or explicitly aimed at stimulating students to be active.

We have implemented our philosophy of learning by including exercises which will provide some surprises and make reading this handbook a very active experience. We will ask you to analyze various examples of teaching communication, invent responses to problematic situations, and look within yourself for various attitudes about teaching. While you can read these simply as illustrations of the ideas presented, we think you will find the material more vivid and meaty if you work through the exercises as you go along.

What follows is a "cookbook" in the best sense: a set of recipes which you can use, combine, or tinker with, to suit your taste and to reach the objectives that matter to you. The detailed Table of Contents on the following page will give you a list of available ingredients.

CONTENTS

We encourage you to use this handbook in either of two ways: (1) as a complete set of teaching ideas, which can be read cover to cover; or (2) as a sourcebook which you can read selectively to help you deal with a particular situation. The Table of Contents is designed to give you the kind of information that will enable you to use the latter approach.

SECTION		TOPIC	PAGE
I.	Setting Learning Goals	This section helps you to assess the various objectives--stemming from your goals and from those of the professor and the students--which you will need to take into account in deciding how to handle your part as a TA. The desired outcome is a creative blend of these and other factors.	7
II.	Helping Students Think Systematically and Creatively	In this section we focus on the more complex learning objectives, those dealing with thinking *process*. We stress questions and activities which help students to organize their thinking and to draw on the creative ability which we all possess.	18
III.	Implementing Your Goals	This section concentrates on ways to direct or control the course of events in class. Our emphasis is on getting what you want done without being a dictator, and on using various *degrees* of structure flexibility to accomplish various purposes.	25
IV.	Stimulating Student Participation	Here, we examine ways of getting students to interact with you and with each other. This includes strategies for asking effective questions, and setting a climate in which students will want to become active.	27
V.	Responding to Student Input Productively	The response you make to a student question, answer, or comment has a major effect on his or her willingness to venture again and on what he or she learns. This section stresses ways of responding effectively.	33
VI.	How to Present Material Effectively	We call this section, "lecturing is a two-way street," and emphasize that it involves effective organization of material, a good style of presentation, and awareness of the key needs and problems of the student audience.	37
VII.	Alternative Classroom Formats	The traditional formats of lecture, recitation, and group discussion are valuable for many purposes. But some goals are best attained by other means, and all goals can be reached by many paths in addition to the familiar ones. This section describes a number of new formats and the purposes they can serve.	46

SECTION		TOPIC	PAGE
VIII.	Getting Good Feedback	You need organized, systematic ways of assessing student reactions to your teaching, including questionnaires, videotape, etc.; this chapter is a compendium of such suggestions.	53
IX.	Further Reading	Suggested readings in various topics covered by this handbook.	55
X.	Campus Agencies Available to Students	On-campus resources which are useful when you have students with problems that go beyond your teaching role: emotional problems, special learning problems, career/major choice dilemmas, and others.	57
XI.	Sample Questionnaires	Questionnaires developed by TADP that you can use to find out students' perceptions of you and of the course. These can really help you to improve your teaching.	59

OUR OBJECTIVES

As you may have noted in the Table of Contents, the first topic we deal with concerns establishing learning objectives. This means identifying the outcomes, in terms of student capabilities, which you want to result from the learning experience.

We are following this advice here, by offering our own set of objectives. We believe that any teacher who succeeds in doing a good job at all of the twenty skills presented on the following page will be a very good teacher indeed, and therefore they represent the desired outcomes of all our T.A. development activities. Of course, few of us get all the way, but the point is to provide a framework which will establish what we mean by good teaching.

You can use this objectives list to get a general idea of our framework, and also as a starting point for thinking about your own teaching. To do the latter look over the objectives list and place a "+" opposite those skills you feel most confident of performing well. Then place a "?" opposite the skills about which you want to learn more. This will give you a rough-and-ready self-portrait, one which you can use as an agenda for your own development. And you can follow up the topics identified by turning directly to the handbook pages bracketed after each objective.

OBJECTIVES

An effective TA should be able to...

ATMOSPHERE	___ 1.	Establish a climate in which students will want to participate and learn (pages 31,33)*
	___ 2.	Form good rapport with students (page 31)
	___ 3.	Help students overcome anxiety as an obstacle to learning (pages 35-36)
GOALS	___ 4.	Identify students' goals, learning needs, and learning styles (pages 7, 12-13, 46-47, and 67)
	___ 5.	Define course goals in terms of the performance expected of students and how it is to be measured (pages 7-9)
	___ 6.	Implement course goals in planning activities geared to produce the desired learning (pages 8-9, 14-17, 24-25, 45-51)
DIRECTION	___ 7.	Flexibly guide discussions to produce varying degrees of topic focus versus openendedness (pages 25-26)
	___ 8.	Incorporate student needs and interests in how class time is used (pages 14-16, 25, 46-47)
PARTICIPATION	___ 9.	Provide opportunities for students to participate in class (pages 27-32)
	___ 10.	Ask questions or pose topics which will engage students' interest (pages 18, 42-43, 46-52)
	___ 11.	Encourage students to discuss directly with each other (pages 25-26, 46-52)
	___ 12.	Ask followup questions which will stimulate students to elaborate, clarify, and/or support their statements (pages 33-34)
THINKING ORGANIZATION	___ 13.	Organize and present material in ways that help students learn (pages 37-45)
	___ 14.	Present and discuss material at varied levels of difficulty and complexity (pages 18-23)
	___ 15.	Ask questions or pose topics which will stimulate students to "learn to learn" and become more self-sufficient (pages 23, 38-41)
RESPONSE	___ 16.	Reward students effectively, so that they become increasingly willing to learn and participate (pages 33-35, 44-45)
	___ 17.	Correct students in such a way that they remain involved, rather than withdrawing or otherwise reducing their learning efforts (pages 33-34, 35-36, 44-45)
	___ 18.	Inform students about their performance in ways that will help them learn better (pages 33-36, 44-45)
FEEDBACK	___ 19.	Read nonverbal cues as to students' feelings and attitudes (page 34)
	___ 20.	Elicit students' reactions as to how the class is working out, so that improvements can be made (pages 53-54, 59-67)

*Note: In some instances only a subheading, and not the entire page, is relevant to a given objective; a moment's scanning will usually locate the appropriate section.

I. SETTING LEARNING GOALS

Before the first class, it is important to set goals, both for yourself and for your students. Be honest with yourself and with them. Knowing what you expect from each other helps to instill trust, reduces the time for getting used to each other, and focuses students' learning efforts more efficiently. Goals can be more complicated than they look, because several kinds are involved: the professor will have some teaching and learning goals in mind, and the structure of the course will sometimes produce a different set. Students come with their own purposes, sometimes idiosyncratic or at odds with course goals. And you will have your own goals for the section as well as a need for satisfaction as a teacher. Often these goals will conflict; you as the TA can wind up with the resulting headaches, or the satisfaction of blending them in a way that makes your section a productive learning experience. In the rest of this section, we will talk about how you can take account of your own goals, course and professor goals, and students' goals in developing a teaching plan for yourself.

The above-mentioned goals all affect the goals and activities in section and lab somewhat like this:

Below, we will talk about the final product, *Section Goals*, first, and then examine each of the three contributing elements.

A. Goals for the Section or Lab

In most classes you as the TA can make a unique contribution to student learning. You will have the most personal contact with students, and can open channels for them to express puzzlements and get help. You will have opportunities to observe students working with the material, as they try to deal with questions in a section or a laboratory activity. Also, you will often be the one to grade their papers and tests. That means that you can, in addition to giving information, help them improve the way they think--a most important objective in our opinion. If you create a hospitable and stimulating atmosphere and develop personal contacts with students, they will give you many opportunities to provide them with this type of feedback. The result will be that they can tackle the next question or problem in a better way, rather than having to return to you each time.

We will discuss two types of goals: *learning goals* and *process goals*. Learning goals deal with the *what* of learning: the information, concepts, skills, etc., you want students to learn. Process goals deal with the *how* of learning: the kinds of activities, ways of communicating, and ways of thinking you want to set up in your class. The two are linked in that the process should lead to the learning outcomes you select.

1. Learning Goals

Exercise #1

What differences can you identify among the six goal statements listed below (each of the following should be viewed as a separate and complete statement of a teaching goal):

1. A To present Chapter 2 on Newton's Laws.

   B To have students leave class being able to use Newton's Laws to calculate the time taken for various objects to fall from various heights.

   C To have students be able to select an appropriate coordinate system to express Newton's Laws in solving many-body problems.

2. A To give the students an appreciation of several styles of the same musical instrument.

   B To have the students be able to identify from drawings French, Italian, and Flemish harpsichords.

   C To have students be able to select from among several styles of harpsichords the one they find most aesthetically pleasing, and to articulate their reactions by reference to specific stylistic features.

1A vs. 1B and 1C? _____

_____

_____

_____

_____

2A vs. 2B and 2C? _____

_____

_____

_____

_____

Statements IB, IC, 2B, and 2C are examples of *behavioral learning objectives*. They have in common several qualities:

(1) They define goals in terms of what the *student* does, not in terms of what the teacher does (this is in contrast with statement 1A).

(2) They designate an *observable action* by which the student is to demonstrate learning (this is in contrast with statement 2A).

(3) The action is to be carried out with a specified set of data, materials, or ideas (neither 1A nor 2A mentions this).

(4) They indicate what the instructor or evaluator should use as a criterion for success; they answer the question, "what would you accept as evidence of satisfactory performance?" (neither 1A nor 2A does this).

Translating your teaching material into behavioral objectives enables you to establish an important thread of continuity among four major aspects of the course: (a) your initial planning and preparation; (b) your introduction of the course to students; (c) the teaching style and format you use; and (d) evaluation methods. It will be easiest to expand on this concept by beginning with point (d).

A behavioral objective statement virtually writes exam questions or assignment topics all by itself. Each of the four statements listed earlier (1B-C, 2B-C) suggests a class of questions or problems which can be used to evaluate students. Planning what you will cover in section and how you will cover it also fall into place. When objectives are defined in terms of what students should *do*, it becomes blindingly obvious that class activity and other work must provide *practice* in doing it. Thus if 2C is the objective, one would not want to lecture about the various characteristics of harpsichords--at lease not beyond an introductory session. The reasons for this are twofold. First, knowledge of characteristics is at best only a basis for the major objective, making aesthetic judgments; and second, students will need practice in making such judgments as well as in refining them through discussion and critique. This is best done in a seminar rather than a lecture format.

Finally, students will be better able to direct their own learning if they have behavioral objectives to work with. They will know what the instructor has defined as important, and can plan toward the final outcome (including evaluation) rather than passively accepting each new piece of information as it comes along. They will also gain the satisfaction of knowing when they have attained various subgoals. Further, this method reduces the risk of misunderstandings about grading; students are less likely to feel that they were not given adequate warning about the basis for assigning grades.

It is sometimes argued that being too clear about grading criteria simply encourages students to study narrowly for exams with the result that they know *only* what is tested rather than the broader base of knowledge which the test is intended to sample. While this can be a serious problem, the counter-strategy often turns out to be: "Let's confuse students about how we will evaluate them, so that they will learn lots of stuff in order to be ready for anything." This approach is neither honest nor efficient.

One solution for the above dilemma is based on this observation: that test-oriented studying is more apt to be a problem when the tests themselves are narrow and oriented to the memorization of bits of knowledge which can be "given away" in advance. By contrast, objectives which ask students to *organize* and *use* what they know challenge them to develop broad skills, and are much less susceptible to test-oriented cramming. We also think that even learning "the facts" is more efficient when the student develops an organizing principle. This approach is exemplified in statements 1C and 2C, both of which ask students to analyze the material and make judgments about how to interpret or approach it. The contrast between these two statements and 1B and 2B involves a difference in level of thinking, a topic which is discussed further in Section II.

2. Process Goals

Process goals deal with *how* you are going to organize the class in order to stimulate the kind of learning you want, as set forth in the learning objectives. "I want lots of discussion" is a process goal. So is "I want students to feel enthusiastic in class," and so is "I want to ask questions that will challenge students' assumptions." Process and learning goals must be consistent in the sense that you expect the classroom process to lead to your learning goals. If in a psychology course, for example, you want students to learn how to critique an experiment and distinguish better from poorer experiments, it will not be enough for them to learn the details of a number of experiments, and perhaps, not even enough for them to hear you point out weaknesses. You will probably be better off providing some criteria of quality, and then asking them to practice critiquing--perhaps beginning with some glaringly bad work and moving toward more subtlety.

Having briefly defined the two kinds of goals you will need to establish in planning to teach, we turn to the main factors which should influence those plans. At the close of this section, we will sum up by suggesting ways to carry out your planning.

B. Your Own Teaching Goals

Your needs, your sources of satisfaction, and your personal style as a teacher will all have a strong influence on how students react in your class and how well they learn. The more you know about yourself, the better you will be able to accomplish what you want. Also, teaching should be a rewarding experience for you. The following exercise should help you identify what you want out of teaching and to help toward accomplishing this more effectively.

Exercise #2

(a) Please imagine that at the end of the quarter you receive a highly complimentary letter from a student. Now, what has that student said? What, for you, is the ultimate compliment? Please jot down an approximation below:

_____

_____

Teachers vary a great deal in answering this question, and you can probably learn some important things about your own motivation from your response. Does the compliment deal with your interest in students? Your skill as a presenter? Your ability to keep students interested? Your intellectual creativity? Your fund of knowledge? Knowing "where you live" as a teacher can help you stay involved; designing your teaching so as to maximize these satisfactions for yourself (within the context of course goals, naturally) will make it more rewarding for you, and thus, probably more interesting for students. You may also be able to recognize some problematic situations as ones which frustrate your own personal needs.

(b) Now please think about a second question: picture the worst thing that could happen to you while teaching--your own personal nightmare about what could go wrong. How might you and others react? Describe this situation briefly below:

_____

_____

_____

As with compliments, there are different types of nightmare situations. The following are some of the most common. With each, we suggest preventive measures. If you can relax about the chief nightmare by forestalling it, you are then free to pay attention to other things and to convey a more relaxed mood to students.

Nightmare #1 ■ They won't like me.

Worrying about students' personal reactions often prevents dealing with the subject. One way to ease this is to come early and engage students in casual conversation as they arrive. You will get a feel for them as people, and for their concerns, and thus be more comfortable in class. Another is to use an "icebreaker" (see Section VII).

Nightmare #2 ■ I'll lose control of the class.

This worry is a matter of anticipating events, and can be self-defeating if one tries too hard to control the situation and thus produces resistance. A more productive approach is to begin each class with an agenda, which you have made up, and then to invite students to add to it. This enables them to see your goals and help accomplish them. It also allows them the opportunity to change direction in an orderly way rather than by interrupting.

Nightmare #3 ■ I'll bore them.

A problem here is that anxiety often makes us more inhibited and hence less interesting! A way to deal with this is to include, early on, a topic which particularly excites you--about which you are almost sure to be interesting. Another is to ask students, in the beginning, to list on the board topics which interest them; one is generally more interesting when speaking to the interests of others.

Nightmare #4 ■ I'll be caught out in a silly mistake or not know how to answer a student's question.

We find that one loses more credibility by trying to flounder one's way through a question or bluff too visibly. It is better to simply defer a question until you can check the answer, or to ask other students for help. Asking students to list their problems at the start of the class can also help here, since then you can review them all at once and anticipate how to deal with them without being caught unexpectedly.

C. Course and Professor Goals

The professor's approach is the context for your work in a lab or section, and there will be great variation in how much latitude you will have within this framework. We stress two points:

First, *establish communication with the professor, in advance of the quarter if possible.* Ask what you need to know. Don't assume, until it is proven, that your suggestions about the course or information about student reactions are unwelcome.

Second, *develop a picture of the professor's objectives and how they are to be implemented.*

We suggest the following approaches:

Exercise #3

1. Ask the professor to describe his or her learning objectives for the course. Phrase your questions so that you can define them in terms of the behavioral objectives system we discussed above (pp. 7-9).
2. Listen to the professor's introduction of the course to students. What kinds of learning objectives are implied in these statements?
3. Assemble information about evaluation methods (such as previous exams). What objectives are embodied here? How are they related (or unrelated) to 1 and 2 above?
4. Look at the course syllabus. Put yourself in the place of a student working through it: What is the pace? The depth of coverage? How is the syllabus coverage related to the evaluation objectives? What "holes" might you have to fill in preparing students for assignments or exams?

D. Students' Goals

Most students will come to class with some notions of what they want, which can be anything--professional preparation, an easy "A," "I have to because it is required," or an interest in the subject matter. Defining learning goals explicitly is a relatively new idea in education, and most students have been encouraged to hold a very passive view of their role. So you may have to work to get them to put their goals into words, but the result can give you valuable information. Some answers will be useful in planning the class, some will puzzle you, some will dampen your enthusiasm, and some will give you the key to reaching the genuine interest in a particular student. Whatever the result, you will be better off knowing something of what is going on in students' heads.

Exercise #4

At your first class meeting, go around the room and ask each student one or more of the following questions:

(a) What do you expect from this class--what do you expect to be able to do, or to know at the end that you don't know now?

(b) Please mention one good experience and one bad experience you have had with this subject matter in a previous course; how did you feel, and what did you do about it?

Question (a) requires somewhat more sophistication, while (b) is probably better for freshmen or any students who have trouble articulating abstract goals.

How might you use this information? Here are a couple of examples:

TA: WHAT DO YOU EXPECT TO GET FROM THIS CLASS?

#1 *Student Reply*: Well, it's a requirement....

TA: Have you ever had a similar subject before?

Student Reply: Yeah, in high school...I hated it.

TA: Was there some part that was especially bad or frustrating?

Student Reply: Yes....

(This conversation, continued, can identify anxieties and obstacles to learning which can work on as the course proceeds.)

#2 *Student Reply*: I've always been interested in this subject. Maybe I'll major in it.

TA: Is there some aspect of it that really excited you?

Student Reply: Yes, when I wrote a paper and saw the connection between....

(This conversation can identify special interest areas and knowledge which you may be able to build on in your planning.)

This listing of so many factors may seem complex or confusing: we have *TA goals, student goals,* and *course goals,* all interacting to generate *learning goals* and *process goals* in the lab or section. To make all of this more vivid and realistic (though not necessarily less complex) we offer the following fictionalized scenario representing one TA's way of cooking up a class.

SCENARIO

Joe and the History of Atlantis

This quarter Joe is TA'ing for History 97--History of Atlantis in the 21st Century. Professor Merman, who has a reputation for being stimulating but disorganized, tells the TA's that he intends to concentrate on five key events* in Atlantis' history; he expects the TA's to give students the necessary background for understanding the importance of these turning-points. The text is an important ingredient in this process.

Joe discovers that past exams are composed of short identification and definition questions. He gets the idea that Professor Merman will be very impressionistic and that the TA's will have a large share of the responsibility for preparing students to cope with this type of exam. It also seems to him that the lectures will be much more thematic and integrative than the exams.

Joe has a philosophical orientation to history, and likes to look at it in terms of understanding the human condition. He knows he will like TA'ing more if he can get students to share this interest, but he also wants to help them pass Dr. Merman's exams. He also knows from past experience that he is apt to get lost in long, subtle exchanges with like-minded students, leaving the class confused and turned off. So he knows he will have to solve some conflicts of approach.

Joe finds that the other TA's share some of his reservations, especially about the mechanical nature of the exam. Getting up their courage, they approach Professor Merman and suggest that a paper or some essay exam questions could be added. He tells them that he put the exam together quickly some years ago, and since this is not his main field he never wanted to put the effort into revising it. He encourages the TA's to make up some sample questions and topics dealing with the five key turning points he plans to cover; it is agreed that this will be a more consistent way to present the course to students.

Joe makes some advance guesses about his students. He knows that all will have had at least one history course, and that about half are present or prospective history majors. So he expects a fairly high level of interest, and an absence of extremes in level of background or sophistication. Many of the majors may turn out to be a helpful resource through their knowledge of research methods in history. In the first section meeting, he asks his 16 students to jot down on a piece of paper their main reasons for taking the course, and asks one student to read over and synthesize the responses while he is taking care of some preliminary business. In general the responses confirm Joe's hunches: six people mention a specific interest in Atlantis itself: five (all majors) say they want to study a historical topic in more depth than previously possible; several mention liking Dr. Merman's lively lecture style; four say they needed to fill a general Humanities elective; and two others express a special interest in military and political history.

Joe now sees some possibilities for getting it all together, at least more so than at the beginning. Being able to include a paper and some essay questions will free him from having to conduct a memorization-cram session and allow him to include some of his interest in a broader perspective without feeling guilty that he will be harmful to his students. He thinks students will now see more relationship between the lectures and the exam and the paper, which means they will be more comfortable and he will not have to work so hard to bridge the gap. This will be of most help to the students who signed up more for Professor Merman than for the subject, since being turned on by him will also help them do well. There is also more room than at the start for the "in depth" oriented students, who will be naturals for a project of some sort which can now be fitted into the paper topic. Joe also thinks that some group projects--each group having some history majors and some less sophisticated students--might help to tie the class together and bridge the differences in background which do exist.

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*Two coups, a collapse of the water-dike system which was weakened by neglect stemming from corruption, a war leading to conquest by another power, and a sudden reordering of social and economic power following the discovery of vast oil deposits under Atlantis (at a moment when the rest of the world was running out).

With all this in mind, Joe comes up with a plan for the quarter, which he proposes at the next section meeting. Of the remaining nine sessions, five will be set aside to deal with the five turning-point topics, each following Professor Merman's lecture on the subject. He divides the class into five work-groups (each including one history major) and asks each to take responsibility for researching one topic. This responsibility includes making a group presentation to start that session and helping the class to construct a time chart which will place various people and events in perspective and help make sense of the turning-point event itself. The other class sessions will be free for open discussion, student questions, and topics suggested by students.

The term paper topic can be developed by the student and approved by Joe, or selected from among those he has suggested. He feels comfortable in including a liberal sprinkling of philosophically tinged subjects in this list, since students will be free to make other choices too. He expects to hold conferences on these topics during office hours and hopes he will find some kindred spirits with whom he can banter ideas at length on a one-to-one basis.

Joe begins by leaving the "open" sessions very open, simply asking if anyone wants to bring up a question or topic. A discussion generally gets going, but the participation is fairly uneven. The majors tend to speak more; and Joe notices also that the teams who have already given their "turning point" reports are somewhat more active in the general discussion. To capitalize on this, and to give the sessions somewhat more focus, in the next open session he asks the students to meet for five minutes in teams, to list the major points that puzzle or interest them from the current lecture or unit. From this he builds the "agenda" for the day, hoping this will help students ease into participating (in the small groups) and make the topic of discussion more relevant to their needs. This does seem to help in the next session. Joe also notes that his tendency to focus his attention on "favorites" has cropped up again, and makes more of a point of spreading his involvement: He drops in on each team as it is talking, makes extra eye contact in class with the students he knows less well, and tries to give a prominent place to the subjects these latter individuals have contributed to the agenda. Participation in class does improve, though he can never be quite sure which of the several methods he's trying were effective--or whether the improvement was just a result of everyone becoming better acquainted.

After the first midterm, Joe decides to ask for students' reactions via a questionnaire plus written comments (see sample questionnaire on page 59). He asks students to comment particularly on the team/time chart format, and is pleased to find that most reactions are positive. However, there is some complaint that neither Joe nor the Professor gave specific enough indications about what was going to be emphasized on the exam--especially on the multiple choice part. His two best questionnaire ratings are for his interest in students and his encouragement for expressions of puzzlement and confusion (Items 4 and 8). On the other hand, they want him to tell them more directly what is correct or incorrect (Items 12 and 13), and to set goals more effectively (Item 3). When he lists these results in class, students say this last rating applies mainly to the "open" sessions.

Joe feels he can remedy the lack of goals by establishing even more definite agendas at the start of the open sessions. However, he is in more of a dilemma in responding to the desire for right/wrong feedback. He realizes that this lack makes students anxious, especially in connection with the multiple-choice part of the exam, but at the same time he doesn't want to undermine the seminar-like nature of the meetings by making himself more visible as the arbiter of each point. He explains this problem to the class, and compromises by giving feedback on some occasions and not on others. He worries that he is being inconsistent, however, and hopes to think through a better solution to this problem the next time he teaches.

Joe is satisfied with the students' choices of term projects, and does in fact find several whose interests coincide with his own. Three students ask permission to do a joint project, and he meets with them together in office hours several times in the last half of the quarter. The students seem to have gotten the hang of the "time-chart" idea by the end and his section, as a group, are above average in their final grades. His student ratings are better by the end, too, especially in clarity and setting goals; so all in all Joe thinks his section has turned out pretty well.

Exercise #5

Planning Guide

We have stressed so far that planning begins at the end; that is, the objective, which comes last, is the first thing to think about. The planning guide reproduced on the next page reflects this approach. Box #1; the starting point, is at the extreme right: you *fill it in* from right to left, and then *carry it out* from left to right--hopefully arriving at your objective by the end of the teaching activity (which may be a single class, a quarter, or whatever). The planner assumes that your general objectives have a direct influence on the performance measurements you use, and that this in turn determines how you want students to *practice* meeting those objectives during the course. This has a *content aspect* (what to talk about) and a *process aspect* (how the students are expected to think about the material). Finally, as we've explained, we are believers in making objectives explicit; therefore the "final" category at the left deals with how you present objectives to the students. Row 1 of the planner has been filled in with examples from Joe's planning process. You may want to try out a similar approach with your own course material.

Another way of establishing your own learning goals--this time more in terms of process--is to fill out the questionnnaire (section or lab as appropriate) at the end of this handbook (see page 59). You can make "D" ratings to show how you would like the class to be and compare this with how things turn out later. (Since one can't do everything at once, try to set priorities, limiting your highest rating--6 and 7--to less than half the items).

TEACHING OBJECTIVES PLANNING SHEET

Instructions:

It is in the nature of objectives, or outcomes, to arrive last. Yet our *concept* of the outcome can have an important influence on what leads to the objective. For this reason we ask you to work in *right to left* order in thinking about the categories below. The result should be a clearer picture of how objectives can shape your planning for other aspects of the class.

	5. How are your expectations communicated to students? What is their picture of the objectives they will need to meet?	4. What about the "how" of teaching? What sorts of formats or activities will you use to help students practice the abilities needed to meet (1) and (2)?	3. What subject matter content will you cover in order to help students meet the expectations in (1) and (2)?	2. How are these changes to be measured? What sorts of performances by students (exams, papers, etc.) will be the criteria?	1. How do you want students to be *changed* as a result of this class? What will they be able to do that they can't now?
Joe's Planning	Student-voiced need for more advance warning *re* the nature of evaluation process.	Practice in integrating material via work group projects and presentations; time-chart; and paper writing.	Coverage, in more depth, of five turning points dealt with in lecture, and related factual material.	Essay questions Paper Short-answer exam	More able to link key events in cause-effect sequence; better able to identify crucial events among less important; increased fund of information.
Your Planning					

II. HELPING STUDENTS THINK SYSTEMATICALLY AND CREATIVELY

Exercise #6

A fourth grade student was asked to spell a familiar English word, and wrote: SIDASIN. What is the word? People often have to puzzle over this, so think a minute before reading the footnote.*

It would be easy to simply label "sidasin" a spelling error, correct it, and move on; but this would be to miss an important fact. This student had invented her own implicit phonetic spelling system which, given the vagaries of English pronunciation, is really just about as workable as the "right" answer. Psychologists who study intellectual development have found that a powerful capacity to organize information exists in human beings from the early years onward. One indication of this is the fact that children's grammatical errors often involve exceptions. They have formulated rules and apply them (as in "falled" for "fell") systematically; only later do they memorize the arbitrary variations.

Our best approach to teaching is to help learners expand, refine, and build on this organizing ability. The patterns of thought students generate on their own should not be replaced with "official" systems, or (worse still) with rote memorization, but cultivated to help them become autonomous learners and to assimilate new ideas meaningfully.

This approach is important for you as a TA because most college-level material is organized into a system, with key concepts, themes, or principles which must be grasped if the student is to genuinely use the knowledge. Even where a course places heavy emphasis on memorization, helping students develop a framework is important because memory is largely a matter of information retrieval; most of what we have learned is there in our heads somewhere, and systems of thought are our way of getting access to it. You as a TA have a unique opportunity to develop these capacities in students because in section or lab there is a maximum opportunity for students to express, compare, test, and improve their ideas.

This ability to organize information comes in many forms, and a necessary starting point is to classify the thought processes involved. Having such a classification in mind will help you think about what students are doing, and you can also frame questions, assignments, and so on to stimulate a particular kind of activity. The system that follows, developed by Benjamin Bloom,** is one of the most widely used and is based on the notion of a hierarchy of thought processes. Each category requires more complex thinking than the one preceding it, and also builds on or incorporates the preceding types of thought. That is, one needs the capacity for "lower" levels of thought in order to proceed to the "higher" levels. This in itself suggests a teaching strategy: In the early stages of a topic, there should be more emphasis on lower, more basic thinking processes; as this is mastered, students will be able to move up the hierarchy toward more complex ways of dealing with the material.

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*If you are still puzzling, try pronouncing SIDASIN aloud. If that doesn't work, see the footnote on the following page.

**See *Classroom Questions: What Kind?* by Norris Sanders in the reading list (Section IX) for more detail.

Descriptions of the Major Categories in the Cognitive Domain

Category	Illustrative Performance Statements
1. *Memorization.* Memorization is defined as the remembering of previously learned material. This may involve the recall of a wide range of material, from specific facts to complete theories, but all that is required is the bringing to mind of the appropriate information. Memorization represents the lowest level of learning outcomes in the cognitive domain.	a) States names of 4 European rulers during World War I. b) Describes how to titrate. c) Defines deviance.
2. *Comprehension.* Comprehension is defined as the ability to grasp the meaning of material. This may be shown by translating material from one form to another (words to numbers), by interpreting material (explaining or summarizing), and by estimating future trends (predicting consequences or effects). These learning outcomes go one step beyond the simple remembering of material, and represent the lowest level of understanding.	a) Summarizes Plato's views on good and evil. b) Describes the composition of the nucleus of an isotope from its position in the periodic table. c) Restates the concept of the superego in his or her own words.
3. *Application.* Application refers to the ability to use learned material in new and concrete situations. This may include the application of such things as rules, methods, concepts, principles, laws, and theories. Learning outcomes in this area require a higher level of understanding than those under comprehension.	a) Calculates the volume of a sample of gas under any conditions. b) Writes a coherent paragraph, as given by the basic rules, to express his or her idea. c) On the basis of a description, classifies a society as embodying organic or mechanical solidarity.
4. *Analysis.* Analysis refers to the ability to break down material into its component parts so that its organizational structure may be understood. This may include the identification of the parts, analysis of the relationships between parts, and recognition of the organizational principles involved. Learning outcomes here represent a higher intellectual level than comprehension and application because they require an understanding of both the content and the structural form of the material.	a) Identifies the ions in an unknown using a chemical qualitative analysis scheme. b) Identifies the key themes in a short story, and shows how they are interrelated in producing the outcome. c) Identifies several central values in a nonwestern cultural system, and shows how they are expressed in economic and religious activites.

From previous page: The word is citizen.

5. *Synthesis.* Synthesis refers to the ability to put parts together to form a new whole. This may involve the production of a unique communication (theme or speech), a plan of operations (research proposal), or a set of abstract relations (scheme for classifying information). Learning outcomes in this area stress creative behaviors, with major emphasis on the formulation of new patterns or structures.

   a) Devises a scheme for the synthesis of an organic compound from a given starting material.

   b) Working from original documents, constructs an account of how European intervention affected the Civil War.

   c) Designs an experiment for establishing in what ways certain members of an ecological system are dependent on one another.

6. *Evaluation.* Critical evaluation is concerned with the ability to judge the value of material (a statement, novel, poem, research report) for a given purpose. The judgments are to be based on definite criteria. These may be internal criteria (organization) or external criteria (relevance to the purpose) and the student may determine the criteria or be given them. Learning outcomes in this area are highest in the cognitive hierarchy because they contain elements of all the other categories, plus conscious value judgments based on clearly defined criteria.

   a) Chooses the most efficient scheme of synthesis for an organic compound from among several alternative schemes.

   b) Evaluates the quality of several poems on the basis of internal structure and harmony of imagery.

   c) Compares the adequacy of 3 theories of personality in explaining a specified type of behavior.

Exercise #7

Please select one concept, topic, skill, procedure, or piece of information from your discipline. Write one performance statement (like the preceding examples) which could be used as an assignment, class activity, or test question, for each of the six thinking categories.

Thinking Category	Performance Statement
Knowledge	
Comprehension	
Application	
Analysis	
Synthesis	
Evaluation	

There is a larger sense, too, in which students are engaged in organizing what they learn. Over the college years, most students make contact with new, puzzling, stimulating, and confusing ways of thinking--both in and out of the classroom. William Perry has studied the developmental course of this experience, and concluded that some consistent and recognizable stages tend to occur. We believe that the overall purpose of a liberal education is to help students move through these stages of intellectual and ethical growth, and that each instructor has a part to play in this process. Thus, it can be helpful to you as a T.A. to recognize "where the student is coming from" in terms of the developmental issues with which he or she may be grappling. Perry's work suggests that your teaching efforts may have quite different effects depending on the framework within which a particular student views it. As Perry puts it:*

> Let us suppose that a lecturer announces that today he will consider three theories explanatory of ____(whatever his topic may be). Student A has always taken it for granted that knowledge consists of correct answers, that there is one right answer per problem, and that teachers explain these answers for students to learn. He therefore listens for the lecturer to state which theory he is to learn.
>
> Student B makes the same general assumptions but with an elaboration to the effect that teachers sometimes present problems and procedures, rather than answers, "so that we can learn to find the right answer on our own." He therefore perceives the lecture as a kind of guessing game in which he is to "figure out" which theory is correct, a game that is fair enough if the lecturer does not carry it so far as to hide things too obscurely.
>
> Student C assumes that an answer can be called "right" only in the light of its context, and that contexts or "frames of reference" differ. He assumes that several interpretations of a poem, explanations of a historical development, or even theories of a class of events in physics may be legitimate "depending on how you look at it." Though he feels a little uneasy in such a kaleidoscopic world, he nonetheless supposes that the lecturer may be about to present three legitimate theories which can be examined for their internal coherence, their scope, their fit with various data, their predictive power, etc.
>
> Whatever the lecturer then proceeds to do (in terms of his own assumptions and intent), these three students will make meaning of the experience in different ways which will involve different assessments of their own choices and responsibilities.
>
> If, for the purposes at hand, this hypothetical lecture is allowed to represent a variety of human experiences, and if students A, B, and C are allowed to represent one and the same person at three stages of his life, the illustration will suggest what we mean by a "progression of forms in which a person construes his experience." Furthermore, such words as "progression," "evolution," or "development" (as distinct from the more generic "difference" or "change") would then refer to the fact that, as I have arranged them in the illustration, the three sets of assumptions are in the order of increasing scope. That is:
>
> B's assumptions are of a form which include the form of A's; and C's assumptions include, in a different and broader form, the forms of both A's and B's. This is evident in the different predicament of each student in the event that what the lecturer proceeds to do conforms to the expectations of one of the other students. For instance, Student C faced with the lecture expected by either A or B, would have little difficulty in interpreting the experience accurately without revising his basic assumptions about the nature of knowledge. His assumptions logically extend to the possibility that a given lecturer might "have the point of view that" there was but one correct answer. Student A, however, faced with the kind of lecture expected by B or

*Note: This and other Perry quotations are from *Forms of Intellectual and Ethical Development in the College Years*, (New York: Holt, Rinehart and Winston, 1970).

by C, must either revise his basic assumptions or interpret the experience in some such way as, "The lecturer is talking all over the place" or "This just doesn't have anything to do with the course."

A person moving from the assumptions of Student A to those of B to those of C may therefore be said to be involved in a development, not simply because his assumptions become "better" or more "true"--which is another question--but because the forms of his later assumptions subtend those of his earlier assumptions in a coherent manner, as cannot be said in reverse.

Students A, B, and C represent the first three stages in the full developmental picture in Perry's research. The full sequence, the "Main Line of Development," is as follows:

Main Line of Development

Position 1: The student sees the world in polar terms of we-right-good vs. other-wrong-bad. Right Answers for everything exist in the Absolute, known to Authority whose role is to mediate (teach) them. Knowledge and goodness are perceived as quantitative accretions of discrete rightnesses to be collected by hard work and obedience (paradigm: a spelling test).

Position 2: The student perceives diversity of opinion, and uncertainty, and accounts for them as unwarranted confusion in poorly qualified Authorities or as mere exercises set by Authority "so we can learn to find The Answer for ourselves."

Position 3: The student accepts diversity and uncertainty as legitimate but still *temporary* in areas where Authority "hasn't found The Answer yet." He supposes Authority grades him in these areas on "good expression" but remains puzzled as to standards.

Position 4: (*a*) The student perceives legitimate uncertainty (and therefore diversity of opinion) to be extensive and raises it to the status of an unstructured epistemological realm of its own in which "anyone has a right to his own opinion," a realm which he sets over against Authority's realm where right-wrong still prevails, or *(b)* the student discovers qualitative contextual relativistic reasoning as a special case of "what They want" within Authority's realm.

Position 5: The student perceives all knowledge and values (including authority's) as contextual and relativistic and subordinates dualistic right-wrong functions to the status of a special case, in context.

Position 6: The student apprehends the necessity of orienting himself in a relativistic world through some form of personal Commitment (as distinct from unquestioned or unconsidered commitment to simple belief in certainty).

Position 7: The student makes an initial Commitment in some area.

Position 8: The student experiences the implications of Commitment, and explores the subjective and stylistic issues of responsibility.

Position 9: The student experiences the affirmation of identity among multiple responsibilities and realizes Commitment as an ongoing, unfolding activity through which he expresses his life style.

Some teaching implications of this scheme are as follows. First, an individual at any one of the earlier levels will have real difficulty in comprehending arguments based at the more mature levels. For example, a relativistic view will be very threatening to a dualistically oriented person, who may well retreat into an even more rigid absolutism as a result. And issues dealing with Commitment (e.g., Position 7) may simply be assimilated to what Authority says. Since one cannot leap over developmental stages but must grow through them, the best approach is to sense the students' level of thinking and respond to it, while at the same time offering

experiences that are on its growing edge. Thus students who are anxious at perceiving relativistic issues should be helped to develop tools for evaluating alternatives, for example; and those who accept relativism but cannot move beyond it should be helped to explore legitimate bases for choice and commitment.

Teaching strategies for developing organized thinking and creativity are listed below.

Organizing your thinking and presentations.

1. Define goals for yourself, as outlined in I. (Organize your class material with this in mind.)
2. To begin each class session, put a brief "agenda" of goals or topics on the board. Invite students to comment on or add to the list.
3. Help students restate and articulate what they are expected to learn, via well-directed questions. If they have their own organized view of where the course is going, they will learn better.
4. Define key concepts at the start of a discussion or presentation, to help students use them to organize the material to follow. Use these concepts as a focus of discussion and restate them at the end.

Questioning strategies for organizing ideas.

5. Vary the cognitive level of questions (see Bloom's categories) so that students get practice in thinking at different levels and for different purposes, and understand the relationships among them.
6. When presenting facts, ask inductive questions which will lead students to synthesize and generalize.
7. Ask students to define concepts by examples, and try to find instances which relate to their own direct experiences.
8. Ask questions which encourage students to form hypotheses or explore "if-then" relationships.
9. Use probing and following questions which ask students to deepen their ideas, provide justifications for conclusions, or articulate assumptions.
10. Give reasons and explanations for your own conclusions to provide a model for students' thinking.
11. Ask deductive questions requiring implications or extensions of concepts and theories.
12. Ask questions involving comparisons and contrasts which require students to develop bridging concepts or dimensions.

Questioning strategies for synthesis and creativity.

13. Keep your plan of discussion loose to make room for student interests.
14. Ask open-ended questions with multiple right answers or questions for which "rightness" is secondary (e.g., "How did you feel on reading ____?"). This encourages spontaneity and reduces anxiety over being right or wrong.
15. Use "brainstorming" (see Section VII), a technique which involves listing a number of ideas or answers before attempting any evaluation or selection. Evaluation is not abandoned, but rather postponed so as not to interfere with the flow of ideas.
16. Ask questions you are not sure how to answer. Allow yourself to be pleasantly surprised, rather than threatened, by a student idea that you don't know what to do with, or that sends the discussion in a novel direction.
17. Ask students to react to each other's ideas directly (especially when you aren't sure what to say!). This will add diversity and reduce the tendency to look to the instructor for the "right" solution. Encourage constructive conflict and differences of opinion.
18. Bring up a familiar concept or topic in an unexpected context: How would world politics change if energy supplies were unlimited? What would happen in a confrontation between Hitler and Cleopatra? How would a turbine blade feel if revved too fast? (This approach has been used successfully by a group called Synectics to solve very hard-headed engineering problems.)
19. Encourage students to guess at ideas or answers and then check their guesses; this will get them involved in seeking the results and help them learn to make intuitive, "educated guesses."
20. Ask questions by analogy, simile, or other indirect comparison. Stimulate new concepts by asking for comparisons among apparently unrelated elements.
21. Encourage students to use their own reactions (feelings, perceptions, values) as starting points for exploration of a topic.

Helping students organize their own learning.

22. When completing a topic area, ask a student to summarize the main points for the class.
23. Point at, and help students define, habitual errors or blindspots thy have in attacking questions or problems of a certain sort.
24. Start a discussion about how well the learning goals of the class are being accomplished.
25. In helping students master a specific problem, also help them generalize so that they can apply similar methods to future problems of the same type.
26. Explicitly discuss with the class criteria for valid or invalid conclusions, and encourage them to formulate such criteria for themselves so that they can evaluate their own and others' thinking.

III. IMPLEMENTING YOUR GOALS: HOW TO MAINTAIN THE RIGHT AMOUNT OF CONTROL OVER THE DISCUSSION

Every class, even the most "unstructured," has goals, structure, and patterns of some sort. The variations occur in how loose or tight the structure is, how explicit or subtle it is, and who establishes it. You as TA have goals you wish to accomplish, and material from the course must be covered. At the same time, you will probably want to be open in some degree to new questions or issues, sensitive to what interests or puzzles the students. Some discussions go better when there is some rambling, while others need a tight structure. To handle this well you need skills in guiding the discussions in *varying* degrees, in stimulating spontaneity when you want it and providing a clear track to follow when that is needed. Reducing the amount of structure is effective when you want students to learn how to select important ideas and to organize the material in a personally meaningful way. It is also best suited to more complex levels of thought, such as synthesis and evaluation (see Bloom's categories in Section II). On the other hand, a closely structured class will cover more material, and this is useful when the information is straightforward and students need guidance in order to develop basic skills. Often there can be a progression during the course, with less structure and more student direction as their mastery and readiness to deal with complex ideas increase.

Setting structure should never be done in a way that blocks you from getting feedback about students' problems, and how they are reacting to the class. This can all too easily happen when the teacher sets the learning goals and students go along but feel oppressed and unable to voice their concerns. Setting aside periods of time for open discussion of priorities and problems, and other feedback devices such as mid-course questionnaires, can avoid this problem. "Control" is basically a two-way street, and if you and the students agree on what should be done, then everyone will be working in the same direction.

In the section below, we have listed a variety of specific tips and ideas. We suggest you select from among them the activities you find interesting and those which are likely to help you achieve the goals you have defined for yourself.

Planning the Class Together

1. Define learning goals--what you think students should know by the end of the course or a given meeting, concretely and clearly. Communicate these goals to students.
2. Elicit students' interests and difficulties at the start of the course and of each meeting, and work out a joint agenda. One way is to use the "Laundry List" technique (see Section VII).
3. Discuss with the class what kind of format or formats you are going to use. Pick one or several which they are comfortable with and which are compatible with the class goals.

When You Want to Focus the Discussion

4. Set very specific learning goals and organize them in a clear sequence or agenda.
5. Ask plenty of "convergent" questions, e.g., ones which elicit a single correct answer or a clear-cut standard of correctness.
6. Emphasize frequently what you consider key points in the material.
7. If a comment or question is somewhat off the track, selectively respond to that aspect of it which most furthers the goals of the discussion.
8. When you must set aside a contribution or question as irrelevant, explain why in context of the discussion goals; when possible, indicate a time and place where the point can be dealt with.
9. Periodically, and especially at the end of a meeting, summarize both your own points and the themes of the discussion, emphasizing the continuity with initial class goals.
10. Hold one-to-one exchanges with students (in class); avoid letting more than two or three students speak in a row without your commenting. This heightens your visibility as a model for how the discussion should proceed.

When You Want to Open Up a Broad Discussion

11. Ask lots of "divergent" questions, ones with many equally valid answers which can take the discussion in any one of several directions depending on how students react.
12. Ask students to make guesses or estimates in answering some questions. (This technique was suggested by a math professor, and is applicable even to "right/wrong" disciplines.) This encourages discussion aimed at validating the answers given and backing them up with reasoning.
13. Ask questions you expect will stimulate differences of opinion among students.
14. Define a broad theme around which to organize the discussion, a "ball-park" in which students can roam fairly freely.
15. Encourage student-to-student discussion, by explicitly asking them to react to each other's ideas or by keeping silent until students begin talking directly with each other. This reduces the tendency to look toward authority (you) for the stamp of approval or disapproval after each comment and thus will produce a freer exchange.
16. Use the "brainstorming" method (see Section VII) in which you elicit a number of answers or ideas while suspending evaluative comments (either by yourself or by students) until a later point, in order to encourage the free flow of input.
17. Use a format involving division of the class into subgroups, in which each small group may take off in its own direction in dealing with the topic. Pool and compare the results later in the session.
18. Ask one or several students to sum up what struck them as the most significant points or ideas in the discussion.

IV. HOW TO ENCOURAGE STUDENT PARTICIPATION

Active student participation is possible and worthwhile in almost all sections. This is students' best opportunity to express ideas, compare their views with others, solve problems, raise puzzlements and seek solutions, back up their arguments with assumptions and evidence, and, in general, learn to think. But they can't do all this by being passive, and the questions you ask are an important tool for starting the action.

We often wonder what to do when questions fall flat, and blame the subject matter, student apathy, and the like. Yet questions, to be effective, must be skillfully crafted, and when they are not they often carry the seeds of their own defeat within them. The following examples, transcribed from tapes of section discussions, may help sharpen your ability to see problems and improve your own questions:

Exercise #8

The list below consists of seven pairs of similar questions in mixed order. The purpose of this exercise is to heighten awareness of the characteristics of various sorts of questions through noting similarities and differences. Please compare the questions in the two columns below, in terms of their wording and their likely effects on the discussion. When you identify two that seem similar, indicate this by putting the number from the question in the left-hand column in the blank next to the right-hand matching question.

1. So where is this wild boy better off? In the forest where he started, or in civilization being socialized?

2. So in this story, when's the point of truth for Kurtz?

3. What about the lecture?

4. What possibilities are there for refuge in *A Farewell to Arms*?

5. So, we're talking about the fact that everybody's roles are changing, how--we've mentioned religion and education, how did religion and education during this period affect these changes, or how did the changes affect the kind of religion and education people had?...Let's start with religion ...have women always had a sort of divine place in religion?

6. Let's see if we can make any generalizations about the play as a whole, from the nature of the opening lines.

7. What was the name of the institution?

___A. (Instructor reads a sentence from the novel under study): Well, that's a very rich sentence...there's a lot there.... OK, what's there?

___B. Any comments on Plato?

___C. He talks about envying one character. Who was it?

___D. How do you interpret what the narrator tells you about the hero? What do you make of his return from law school? Why did he decide he didn't really expect too much?

___E. Is Ivan Illych a victim of his society, or did he create his problems by his own choices?

___F. What was the most important's reason for the revolution's failure?

___G. What kinds of things is Hamlet questioning? Not just in his soliloquy, but broadly throughout the whole play?

The questions in Exercise #8 were taken from a study we made of how instructors' questioning styles affect participation.* Since generating an active discussion is important to so many instructors, we began by classifying questions and comparing their "mileage" yield--the average number of student responses which followed each type. The results, along with the matching key for the exercise, are shown below:

Question Type	Items From Exercise #8	"Mileage" (No. of Student Responses)
(1) Playground Question:	6 & A	5.08
(2) Focal Question:	1 & E	4.88
(3) Brainstorm Question:	4 & G	4.29
(4) General Invitation:	3 & B	2.60
(5) Shotgun Question:	5 & D	2.34
(6) Analytic Convergent Question:	2 & F	1.95
(7) Quiz Show Question:	7 & C	1.45

The three most productive questions, at the top of the table, are all divergent and complex. That is, they provide openness to a variety of student responses, and invite students to think at a relatively high level about the material. At the same time, they provide a well-defined sense of direction. By contrast, the less effective questions lack one or more of these essential qualities. The specific types, and the way they are apt to affect students, are described more fully below.

(1) The Playground Question. These questions have structure because the instructor designates a carefully chosen aspect of the material for intensive study (the "playground"). They provide freedom because students are encouraged to choose their own concepts or themes in dealing with the material.

(2) The Focal Question. These questions get their definition from a focused, well articulated issue. Students are asked to choose from among a limited number of positions or viewpoints, and to support their views in discussion. They are thus more guided conceptually than by the Playground Question, but less restricted in the material they may bring in to substantiate their positions.

(3) The Brainstorm Question. The structure of this type of question is thematic: the title is derived from the brainstorming technique, which encourages participants to generate a large number of ideas on a single topic in a short space of time. Freedom stems from the deliberate encouragement of all conceivable ideas or opinions, while the theme delimits the range of what is appropriate.

(4) The General Invitation. This is a Playground Question that has lost its boundaries. It encourages a wide range of response, but the arena of discussion is so broad and vague that there is insufficient direction. Students are likely to get confused or keep their mouths shut

*This study was carried out using videotapes of social science and humanities instructors. For some ideas on how this analysis can be applied to teaching in the natural sciences, see page 29.

because they aren't sure what is acceptable.

5) The Shotgun Question. These are multiple questions, which pack in several weakly related sub-questions all in one breath or ask for radically different kinds of thinking. We call them Shotgun Questions because they often seem to be fired off in the hope that at least one fragment will hit something. Unfortunately, the confusion which results is usually inhibiting to students. In many cases the individual questions which make up the Shotgun Question would be valuable if the instructor would simply *wait* between questions instead of throwing them out all at once.

A subspecies of the Shotgun Question is the funnel Question. It begins with a broad opening question (often a General Invitation), follows immediately with a narrower one, and eventually funnels the students down into a very specific, concrete question (often a Quiz Show Question). This, again, can be useful if one pauses to really find out whether the initial question has "taken"; but all too often the instructor seems to *assume* the failure of the initial question, and to rush in with another easier one; the self-defeating result is that this cuts off the response of any students who might still be formulating an answer to the original query. Question #5 from the exercise is a good example of the Funnel Question.

6) The Analytic Convergent Question. These questions elicit complex, analytical thought, but differ from the first three types in aiming at a single correct answer; they thus provide much less freedom, and discussion is likely to be shortlived for two reasons. First, students may be more tense because they sense a "right or wrong" atmosphere; and second, all response will stop when one answer is labeled as correct by the instructor.

7) The Quiz Show Question. While they may pay off handsomely on daytime television, these questions create an impoverished intellectual atmosphere. They are factually-oriented, one-answer (convergent) questions, and, not suprisingly, produce the least discussion of all. It is worth adding that the first three question types do not differ from the Quiz Show Question in *lacking* a factual emphasis; rather, they differ in asking students to *use* facts rather than merely to recite them.

Application to the Natural Sciences

Because teaching in the natural sciences places more emphasis on correctness, and there are fewer open-ended questions, generating "discussions" is often seen as difficult and perhaps irrelevant. Yet the process of marshalling and organizing information to solve problems is a universal one, and there is more leeway than is usually believed to engage students actively on these terms. To demonstrate this, we have taken a very specific topic in biology -- the relation of cellular genetic structure to evolution -- and developed four quite different questions which can be used in class discussions (or quizzes and exams, for that matter). They are structured to match some key categories from the preceding question analysis.

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1) The Quiz Show Format

1a) What is the number of amino acids in each of the following proteins?

Hemoglobin ___ Cytochrome C ___ Histones ___

1b) How many subunits are there in each of the following proteins?

Hemoglobin ___ Cytochrome C ___ Histones ___

1c) Please evaluate the following statement by checking "True" or "False".

Proteins which enter into fewer types of interactions tend to evolve more slowly than those which enter into more types of interactions.

True ___ False ___

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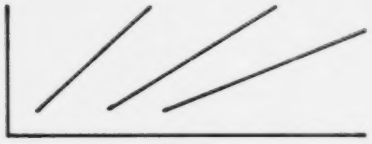
2) The Focal Question Format

Changes in
Amino Acids/100



Time

A. Hemoglobin
B. Cytochrome C
C. Histones

The curves on the chart above represent the three proteins listed to the right of the chart, which evolve at different rates. Which curve goes with which protein, and why?

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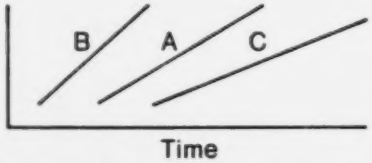
3) The Brainstorm Format

Changes in
Amino Acids/100



Time

A. Hemoglobin
B. Cytochrome C
C. Histones

The chart above represents the evolutionary rates of the three proteins indicated. Please list all the factors which might conceivably contribute to these rate differences.

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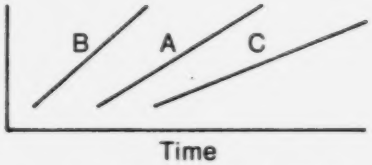
4) The Playground Format

Changes in
Amino Acids/100



Time

A. Hemoglobin
B. Cytochrome C
C. Histones

3. How would you interpret the chart above? What conclusions or implications can you draw concerning the evolutionary process from the data given?

Concrete Suggestions for Stimulating Participation:

Establishing Rapport

1. Find out what excites and worries students. Early in each class, ask them what they are most motivated to discuss. The Laundry List described in Section VII is good for this.
2. Put the chairs in a circle or a similar open form which enables people to gain one another's attention and see reactions.
3. Arrive early and chat with the first few students to arrive, about the lecture, how the class is going, the game they just came from, or whatever comes up casually. Do the same after class.
4. Use varied formats to encourage different kinds of students. Some will be most vocal in small subgroups; some like to play to the whole class; others enjoy a debate atmosphere.
5. Make clear the kind or range of answer you are looking for, and don't get students tied up in guessing what you want.
6. Make lots of eye contact. Try to exchange glances, smiles, and so on with students, and don't just stick to the most responsive students; seek contact with the less participative as well.
7. Require each student to come to office hours at least once, to build personal contact.
8. Be alert to non-verbal cues of interest or readiness to speak, and call on those who look ready.
9. Get to know the individual interests of students, and refer to them in class when the opportunity arises.
10. Go out of your way to encourage students who say little in class. Informally try to find out why they don't (shyness, lack of interest, a feeling they aren't competent). They may represent a segment of the class not being reached by the current approach; build in a place for their concerns.

Questioning Techniques

11. Learn to *really wait* after a question. All too often teachers cut off a lot of valuable activity by getting anxious and moving on too quickly. Waiting is a signal that you really do want participation, gives students time to digest the question, ensures that most students will be thinking during the pause, and provides more openings for the slow to respond.
12. Ask plenty of questions that are pitched at the level most of the class can handle. Success is a powerful encouragement to future participation.
13. Vary the intellectual approach of your questions to provide opportunities for different types of students: Include some information questions, some requiring deductions, some asking for hunches or intuitive leaps, and so on. (See Section II for a typology of intellectual approaches.)
14. Encourage students, by your questions, to use their own reactions and experience as starting points for discussion. This includes their feelings, perceptions, values, and life experiences.
15. Ask open-ended, "divergent" questions--ones with many equally valid answers. This will reduce anxiety over being wrong.
16. Use the "brainstorming" method (explained in Section VII) in which you entertain a number of responses to a question, writing them on the board, before evaluating or moving on. This makes differences among people more acceptable and reduces the worry over being judged which often inhibits participation.
17. Set aside certain times in class when you deal only with basic ("dumb") questions, to smoke out those who may be afraid to ask them. Label this in a way that will save face for students (e.g., by designating it a "review").

18. When you are having trouble explaining an idea, open it up to the class, and ask if anyone else can clarify. Be a model for honesty about your own puzzlements.
19. Following a student contribution, ask if anyone else wants to comment or build on the idea. Break the habit of expecting a statement from the TA after every student input.
20. At the end of a topic or meeting, invite a student to summarize the discussion, or recap a problem solution.
21. Be hospitable to student questions or comments that surprise you. These may be signs that you haven't understood their concerns, and they may have a novel perspective on the issue.
22. Be clear and positive in rewarding all participation. Students will watch what happens to others who speak up, and this expectation affects participation enormously. When you must be critical, do it in a way that doesn't alienate. (See Section V for more detail.)

V. RESPONDING TO STUDENTS' IDEAS PRODUCTIVELY

When students think out loud--to analyze or recall information, develop an argument, express an opinion--you have your best opportunity to help them learn. At this moment they are actively working on the material, and well-directed feedback can have a powerful effect in helping them improve their thinking. You as section or lab TA are in a particularly good position to bring this about.

Your responses to student contributions are also a powerful way to set the tone or climate in the class, since students will look closely at what happens to others and to themselves in deciding how or how much they want to participate. Interesting questions and exhortations to speak out will cut little ice if you as the TA seem impatient to have the student's comment finished so you can go on; or if you always have to tack on a better way to make the point after a student has had his say. What you do with the contributions you get is always the "bottom line" when it comes to eliciting student participation.

Exercise #9

You are trying to complete an important section of course material, and have just finished a mini-lecture on the main points. You ask the class in today's meeting a question whose answer will indicate their comprehension, and a student hesitantly volunteers an answer which seems confused and is using a correct idea in the wrong context.

WHAT DO YOU SAY NEXT ?

Write two or more possible responses below:

1.

2.

3.

4.

5.

What's the "right" way to handle this? Well, it all depends...depends on your priorities, what you think it is most important to do in class right at that moment, and the probable effect on the students, especially the one who just spoke up. Consider the eleven possible responses below, and compare yours. Did you duplicate some of ours? Add to the list?

1. I know that [state what student missed] can be a hard concept to grasp; did anyone else have trouble with it?
2. Well, no, let me restate the point again....
3. Do you mean...[paraphrase]?
4. Well, no, does anyone else want to answer that?
5. Let's get a few more ideas from other people, write them on the board, and compare them...any more?
6. Will you go into that a bit more...can you explain how you got to that conclusion?

7. [To same student or others] let's take this a piece at a time...[followed by a more elementary question about one aspect of the topic].
8. You're getting into a pretty complicated point. I can't go into it completely here, but let's talk after class or in office hours.
9. You have a start with a couple of points [state them]; now can anyone else add some more?
10. You're right about one part [state this], but let me explain again about how we can apply that.
11. Does anyone want to comment on ____'s idea?

While there are many "right" ways to respond in this or any situation, we can improve our teaching by defining the impact of various responses and choosing those which produce the results we value most. Here are some outcomes you may want to consider, as related to the response list above.

(1) In reading the initial statement in Exercise 9, you may have picked up the need to move quickly and cover material efficiently. You can do this by limiting student participation and providing correct information yourself. This is best done by response 2, which is really a continuation of the mini-lecture. Response 10 is about as efficient, but gives the student more credit.

(2) A second goal is to give the student a positive feeling about himself or herself, which could be particularly important with this student because his initial response was given hesitantly--a clue that he may be already primed to expect failure. One set of responses rewards the student by emphasizing correctness as well as mistakes (responses 9 and 10). Others are rewarding in a different way, in that they show continued interest in the student's thinking about the problem. These are responses 3, 6, and 7. With the right sort of follow-up, the student can be led toward greater competence and an improvement in self-esteem. Response 1 simply gets him or her off the hook of feeling singled out for the mistake.

(3) A third goal is to deepen thinking beyond simple restatement of the point as presented. The situation indicates that the student is trying to make sense of a complex, multi-part idea, so there is the opportunity for developing intellectual skills. This is done best by asking for more student activity. Question 5, by inviting comparison among ideas, does this. Question 6 focuses on developing the thinking of the original responder. Question 7 goes back to basics and builds up toward a complex whole. Response 10 is a beginning toward providing the information directly.

(4) Some responses increase the likelihood of future participation. Responses 4, 5, 9, and 11 do this directly by inviting others to get into the discussion. Other responses, by rewarding the original student, set a climate of participation (3, 6, 9, and 10). And response 1 invites all to share in the puzzlement in a non-threatening way.

(5) Finally, you may want to foster independence and self-sufficiency in students. This involves giving them as much responsibility as possible and encouraging them to deal with each other. Thus responses 5 and 6 provide the least direction and invite students to formulate the concept for themselves. Response 11 does this in another way, by encouraging students to talk directly to each other without the TA's intervention. By contrast, responses 2, 7, 9, and 10 provide more structure and information, and may produce more dependence among students.

A final point, and an important one, which affects all of the above, is this: *Nonverbal* communication, by voice tone, facial expression, gesture, will strongly affect *whatever* you say. You can turn people on, or off, by these messages, almost regardless of what words you use. (As an exercise, try saying any of the responses listed earlier, including your own, out loud in both rewarding and negative ways.) Thus you can reward participation in general by nonverbal means, and it is especially important to do this when the substance of your response is negative or critical. The best way to learn more about your nonverbal style and how to control it is to watch yourself on videotape.

The tips and suggestions below deal with methods of encouraging students (first section), and of maintaining contact while giving corrective feedback (second section).

Rewarding Student Contributions

1. Talk directly to the person and respond explicitly to him or her. Make eye contact and use his or her name if possible.
2. Learn to listen carefully and show it. Look attentive, and test your understanding when necessary by a followup question, by paraphrasing what the student has said, or checking on an implication of his or her meaning.
3. Restate complex or inaudible contributions for the whole class, or ask the student to do this.
4. Point out specifically what you thought was valuable in the contribution--don't be content with a vague "good" or "OK" unless the point was very minor or obvious.
5. If you see potential in the comment, draw the student out by asking him or her to elaborate, apply or relate the point in new ways.
6. Build on or incorporate the student's point in a later point of yours, so that the intellectual work of the class becomes a mixture of many people's ideas.
7. Relate the student's point to material being discussed in class.
8. Invite other students to add their reactions or reflections to build further on the original point.
9. Comment on the thinking *process* a student has used, as well as his or her *conclusions*.
10. If a student comment is unclear or confused, help the student find out and express what he or she really was trying to say--show that you care about the original intent.
11. Use non-verbal messages--body posture, facial expression--to reward students for the *act of participating* (regardless of what you have to say about the substance).

Providing Corrective Feedback without Turning Off Students

12. Talk to the *person*. By showing interest you can reward the act of participation while indicating that a particular contribution is incorrect. Make eye contact (which we often avoid due to discomfort just when it is needed most!).
13. Be sensitive to students' pride and fears. In putting forward an idea, a student (and probably you, too) puts his or her self-esteem on the line as well.
14. Be especially alert to avoid any tone of condescension or put-down; a student who is working on an idea, however elementary or naive, deserves respect and you will find that this encourages others to take risks too.
15. Recognize the reality of a high-pressure, competitive campus; students have to worry about grades whether they want to or not. Medical school or graduate school admission can sometimes hang on a few GPA points. Keep this in mind when you have something negative to say.
16. Leave your ego in your briefcase. Looking good at students' expense is the surest way to create a tense, anxious climate which inhibits participation.
17. Be clear, in your own mind, and in your statements, as to the difference between what is incorrect and what you as an individual disagree with. Never use the former to enforce the latter.
18. Admit it when you don't know something. Be a model for students by thinking out loud when you are puzzled.
19. Anytime you aren't completely clear about what a student means, ask a question to clarify. The student may be making a different point than you thought, or be right for reasons you had not thought of.
20. When you disagree or correct a student, restate or paraphrase the point he or she made. This tests your understanding, and also conveys that you take the point seriously.

21. When you criticize a student, ask for his or her reaction to your comment. This keeps the dialogue going and makes it less likely that the student will withdraw. It also conveys that you care about the impact of your statement, and gives you information--often through non-verbal cues--about how the student is feeling.
22. If you think what a student is doing is good (on a paper, for example) but have some criticisms, be as specific as you can in emphasizing both sides. A solid positive comment is a lot better than a vague statement which just assumes the student knows there is nothing wrong with his or her work. Also this approach will put negative comments in a context that is a lot more acceptable.
23. In making criticisms, emphasize what the student can do to change or to improve.
24. Explain your reasons for criticisms and disagreements. Avoid appealing to your expertise or asking the student to accept a point without understanding it.
25. Hold a discussion with students about evaluating and grading criteria. The more students understand the standards, the more acceptable criticisms will be and the better able students will be to improve. Be prepared to change your standards if a valid objection is raised. It is easier to do this in advance than by being pressured later by a series of individuals, each with a different ax to grind.
26. Encourage several students to respond to a question or problem and comment on each other's ideas. This allows everyone to share in the process of evaluating thinking; when the criteria "belong" to the class, criticism becomes more controllable and less of an imposition. A good way to do this is in small subgroups, e.g., for reviewing writing, solving science problems, or working on projects.
27. Elicit many answers without comment, then synthesize and select among them. This method (related to brainstorming--see Section VII) detaches the contributor from the idea and enables the TA or others to borrow parts of several contributions. It will often happen that within a series of answers there will be a self-corrective process; as better ideas come along, the originator can see his error without being singled out.

VI. HOW TO PRESENT MATERIAL EFFECTIVELY: LECTURING IS A TWO-WAY STREET

Given our general orientation in favor of active student learning and plenty of student-teacher communication, you can imagine that we regard the lecture format with mixed attitudes. One point we are sure about is that the reliance on lecture just because it is customary and familiar is overdone. As Abraham Maslow once put it, "If your only tool is a hammer, you're apt to go around treating everything as if it were a nail." Thus we believe that lecturing, or the predominantly one-way transmission of information, has an important place in teaching; but that it should be used when and only when it is judged to be the best means to a clearly articulated learning objective.

In what follows, we will talk about four crucial aspects of lecturing which will help you use the method productively. First, what are appropriate uses for the lecture? We suggest some criteria. Second, how can you direct, or "frame" the lecture material in order to communicate effectively? Some techniques are provided. Third, how can you increase your chances of *reaching* the minds of students? We present a picture of what is going on in their heads, which may help you do this. Finally, we include an outline of key ingredients for an effective lecture which you may want to use in planning your own.

A. Goals

What are good reasons for using the lecture method? Here are some:

(a) When you want to present a body of information with certain emphases as to importance, or a particular way of organizing or making connections among bits of information. This emphasis or structure may be related to the course as a whole or to your own perspective.

(b) When there is a need for more extended treatment of certain material (perhaps already covered in text or lecture) in a way that is attuned to the learning needs of this group of students.

(c) When you want to expose students to a sample of a scholar (yourself) thinking out loud in tackling a problem or a set of materials.

(d) When you want to convey information within the context of a more personal viewpoint than has already been provided; e.g., to convey your own enthusiasm or interest, or describe your own involvement--perhaps research you have worked on.

(e) When you want to convey a body of information which is not set forth in a single place that is easily available to students.

(f) When you want students to know certain information for which you have fairly low-level learning objectives (e.g., because the material is background for the main focus of the course, or because you will only expect recognition familiarity on exams).

On the other hand, we recommend that you use lecture methods sparingly (such as in the form of mini-lectures interspersed with questions and discussion), or not at all, when:

(a) You would be duplicating information which students could dig out of text and lecture notes with a little more effort or guidance.

(b) Your primary objective is to stimulate the more complex thought processes (see Section II) which requires students to be actively *working* on the material.

(c) You are as yet unsure of your students' interests, level of preparation, intellectual approach, or particular areas of difficulty. You are all too likely to be irrelevant.

(d) You are dealing with material which is ambiguous, subject to value judgments, controversial, or in some other way may stimulate students to want to offer their own opinions or analyses.

It is extremely helpful to establish a set of performance objectives to guide your lecture (objectives are discussed in Section I). This may include one or more of the above purposes, or others, and a set of specific learning objectives which define what you want students to be able to do with the information. Sometimes, especially at the start, it can be helpful to imagine that you are going to test them specifically on *that day's material*, and write a quiz which embodies what you think most crucial for them to know or be able to do. When used as an exercise, the

quiz is of course not given, but it can help you focus your introduction to students--what you want them to pay most attention to. Remember to define objectives in terms of student performance, and to include both *content*--what you expect them to know--and *process*--what you expect them to be able to do with what they know.

B. Framing

The term "framing" refers to putting information in context, and is one of the most important contributions you can make to student learning when you present material. "Facts" just lie there until you decide how to group them, how you feel about them, or what implications you can draw from them, and it is this form of running "editorial commentary" which makes the lecture useful and interesting. Below is a list of framing techniques; you will be able to pick the most appropriate one(s), in the light of what you are trying to accomplish in the lecture.

> NOTE: There are always two ways of providing framing: you can do it yourself, via commentary and other messages, or you can invite students to help you do it, via questions to them. By knowing what kind of framing you want to emphasize, you will be able to design questions that will be interesting and also further the main purposes of your presentation.

(a) Framing by Stating Learning Objectives. This is done by presenting a brief introduction to your topic which is cast in terms of learning objectives. This "advance organizer," as it is sometimes called, provides a framework which will help students interpret what they hear. It should be followed up by continued emphasis during the presentation.

(b) Framing by Reference to General Problem Solving Methods. Helping students "learn to learn" can be facilitated by conveying a specific piece of information in a way that will also illustrate a more general method of handling similar problems or materials. It is a big help to make these references explicit: "Now, every time you run across a problem with _____ in it, your first step in setting it up is _____."

(c) Framing by Linking Concepts, Causal Inferences, Comparisons, or Emphasis. For example: "Now this is the crucial step in the analysis"; "Probably you can see that the two situations are made quite different by the presence of 'X' variable" and the like.

(d) Framing by Reference to Student Needs and Questions. To do this effectively, it is important to have previously gathered data from students, e.g., by a "Laundry List" (see Section VII), data gathered from test performance, etc. Framing takes the form of: "Now, I know a number of you were puzzled by____and this is how it works."

(e) Framing by Emphasis on Process. Asides of this kind refer to the thinking process you use to work on the material. For example, "Now, when confronted by this contradiction we have to look for a second variable that may affect the results"; "X's vocabulary suggested to me that there were autobiographical references in his poetry."

(f) Framing by Personal or Emotional Reactions. When you want to put yourself in the picture, include comments like: "I was surprised to discover," "It's pretty disturbing to imagine that, despite our illusions,..." This can also help students place themselves in the situation, e.g., by "you may find it puzzling that...." (This type of framing can also be done via nonverbal messages.)

(g) Framing by Making Reference to Previously Learned Material. You can slant the material by drawing contrasts, similarities, causal relationships with related material: "Now, in contrast to the situation in Nicaragua, the Panamanian dictatorship...," or, "Last week we covered the _____ experiment, which led scientists to study what happens when _____."

□

In framing, you build interest, help students hold the material together by patterns and concepts, and teach them to think effectively.

C. Producing Good Listeners

We recently found an article on lecturing which was fascinating in that it focused primarily on *what makes for good lecture listening*. Nichols* identified 100 "good listeners," who succeeded in absorbing and remembering a high proportion of the facts and ideas in a given set of lectures, and similarly 100 "poor listeners." Then he studied them to find out how they differed. The significance of his results is that you can "improve" your lectures by helping students take on the learned habits shown by the good listeners! To put it another way, the more you can arrange your lectures so as to stimulate good listening habits, the more effective your presentations will be as measured by the one criterion that really counts: how much students learn. By working backward from the key listening habits listed by Nichols we have made some educated guesses about useful lecture ingredients, which are presented below. You may be able to come up with your own, or use the categories as a checklist of possible difficulties when talking with a student who is having a hard time learning.

In the material below, we follow Nichols' format by heading each section with a poor listening habit and then describing the preferred approach.

Habits of POOR and GOOD Listeners

(a) Listening for Facts and Not for Ideas. When asked "What do you do when you listen?", the worst listeners proudly stated that they listened for facts. Yet in a test of comprehension one day later, they retained significantly *fewer* facts than the best listeners and remembered none of the ideas! The good listeners started more modestly. They first sat back and listened for context and themes. When they got the purpose and drift of what the lecturer was saying, they began to note his main ideas. Only when these were understood did they listen for confirming or disconfirming facts. Thus while not directly focusing on facts, the good listener had a higher retention than the poor listener who listened for facts alone.

Some Things To Do

1. Define, and communicate to students, learning objectives that emphasize themes and main ideas. Use these as a basis for evaluation.
2. Introduce some key ideas early, and re-emphasize them periodically to frame the information you are conveying.
3. Provide a handout which (a) outlines key ideas, and (b) includes enough facts that students are relieved of part of the burden of frantically scribbling down information.
4. Ask real and rhetorical questions dealing with deductive and inductive thought, which links facts and ideas: "Given these principles, what data would you expect?" or, "Given these facts, what conclusion do you draw?"

(b) Avoiding the Difficult. The worst listeners were found to turn a deaf ear to the new, the difficult, the technical, and the obscure. The best listeners, on the other hand, charged on and when new points were being made concentrated harder and tried to relate the new to what they already knew.

Some Things to Do

5. Avoid esoteric terminology--big words that emphasize something's strangeness.
6. Allow plenty of opportunity to express puzzlements, and set a climate that encourages this. (See section IV on stimulating participation.)
7. Anticipate difficult points and clear them up. If possible, mention your own initial puzzlements and how you resolved them--be a model for students thinking through a problem.

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*See Nichols, Ralph G. "Listening is good business," in *Management of Personnel Quarterly*, Vol. I., No. 2, pp. 2-10. This research is summarized in an article by George S. Odiorne entitled "The role of the lecture in teaching organization behavior," which appeared in *The Teaching of Organization Behavior*, Vol. II., No. 3, pp. 7-14. Paragraphs a through i, summarizing poor listening habits, are quoted from Odiorne's article.

8. Use a frame that relates new and difficult material to the more familiar.
9. Acknowledge difficult ideas when they arise--so that people won't feel they are the only stupid ones.

(c) Premature Dismissal of the Subject as Uninteresting. The worst listeners tended to dismiss the content if it was at all familiar: "I've heard it before and seen it before so what conceivably could he say that is new" and click went the switch. The best listeners, on the other hand, pressed for the small and perhaps marginal differences and focused on the utility of the message: "OK, I've heard this before, but I wonder if there is some new wrinkle this speaker is going to present."

Some Things to Do

10. Frame the material in objectives that will stress its usefulness and relevance. State clearly at the start the major, hopefully new, points you will make.
11. Assess your audience beforehand. Your material *won't* be old hat if you know what is and is not familiar to the students, and what is likely to interest them.
12. Lead with what is most interesting, novel, eye-catching within your material to set a tone which will prevent dismissal.

(d) Concentrating upon the Speaker's Delivery and Appearance. The one hundred worst listeners focused upon the speaker's slouch, his slur, accent, monotone, or clothing. Mannerisms, grammar, gesture, and facial expression catch hell from this group, and the content largely goes unnoticed. The best listeners start at the same place but are able to ignore the packaging and concentrate on the message.

Some Things to Do

13. View yourself on videotape and/or ask a friend or colleague to help you identify mannerisms that may distract students. Practice changing these.
14. Work on using the nonverbal frame (gesture, voice tone, etc.) to *reinforce* the content; e.g., more vigorous speech when a major point is under discussion.
15. Use a frame that emphasizes your interest and involvement. Pick parts of the material that particularly fascinate you, as a lead, and refer to your excitement. If you feel turned on, your delivery and mannerisms are most apt to convey this and reinforce what you are trying to convey.
16. Make contact with the audience and find students' points of interest. Talk *to* them: this is apt to liven up your own mannerisms, facial expressions, etc.

(e) Faking Attention. Faking isn't easy--it takes effort! It is no simple task to have just the right look of curiosity, nod at the right time, frown at others, keep the pen poised with the body leaning slightly forward. The poor listeners did this while the good ones were also working hard, alert and active from trying to make sense out of the message.

Some Things to Do

17. Don't scrutinize students or otherwise scare them by making them self-conscious about how they look to you.
18. Make the lecture interesting (*see all the other suggestions!*) so that they don't have to fake.

(f) Yielding to Distraction. The bad listener will find something by which to be distracted. The good listeners do not put up with interference around them.

Some Things to Do

19. Minimize potential distractions. Ask a colleague or student to watch for these during your lecture.
20. Make your lecture more interesting than the distractions (*see all the other suggestions!*)

(g) Paper and Pencil Listening. This is the process by which the material goes from my notes to your notes without ever going through the minds of either. The worst listeners tend to make stenographic notes or outline everything in orderly form. The good listeners listen first for the ideas and second for any corroborative evidence, thus spending energy in comprehension of material and not in the organization of notes.

Some Things to Do

21. Provide an outline or ask someone to take notes which can be distributed to reduce students' preoccupation with being stenographers.
22. Pace yourself carefully, since students are most apt to fall back on paper and pencil listening if they have gotten behind and lost the thread of your ideas. Elicit feedback about pace periodically (such as by a show of hands), and pause from time to time to summarize, thus allowing students to catch up and refocus on ideas.
23. Ask a thought-provoking question periodically; one which requires students to break out of the stenographer mode and make use of what they have been taking in. Pause long enough afterward so that the question really sinks into most students' minds before you let one person answer and perhaps take the rest off the hook.

(h) Getting Tangled in Emotional Deaf Spots. The worst listeners, and many of the best, get caught in this problem because all of us have our "emotional buttons." Some word, phrase, or expression triggers our emotional spot and diverts us from the larger message. The best listener merely notes this and keeps listening. The worst sits, fumes, and frames responses and rejoiners.

Some Things to Do

24. Be alert to nonverbal reactions (such as rustling, facial expressions) that may be cues to "deaf spots."
25. Review the material in advance, perhaps with a colleague, for such touchy points.
26. If you consider a "deaf spot" important, be prepared to go into it and discuss pros and cons. If not, delete it. Try not to stir up negative emotions in passing and then leave them dangling.
27. Make sure you are open to interruptions so that a student can challenge you rather than spend the entire class stewing.

(i) Not Filling the Gap Between Speaking Speed and Receptor Speed. The average speaker talks at 100 words a minute, yet we know that adults can receive the same bits of information at rates from 400 to 1000 words a minute. That leaves a gap between the speaker and listener of some considerable size, which provides the opportunity to fall into all the other bad listening habits. This is just what the one hundred worst listeners tend to do. The one hundred best listeners were faced with the same gap, but they used their mental acuity by summarizing what had been said, checking the presented facts against the speaker's main thesis, developing alternative hypotheses for the data, and anticipating what was coming. During the gap, the good listener was carrying on a private dialogue between himself and the speaker, but making sure his own thinking did not distract him from understanding what the speaker was trying to say.

Some Things to Do

28. Use a frame that will encourage the activities listed above; use questions, statements, and rhetorical questions to refer to thinking processes, inductive and deductive activities, and to anticipate the relation of the current statement to the overall objective.
29. Periodically ask a student to summarize what has been said, or ask students to pair up and summarize the lecture to each other.
30. Use a frame related to objectives: "By the end of class, I'll have presented a theory which will account for the following...."
31. Periodically ask students to evaluate the validity of what you have presented thus far. Some teachers announce that they will, at some time, deliberately drop in an erroneous fact or conclusion to encourage this.

D. A Step-by-Step Outline for Lecturing*

BEFORE CLASS**

1. What can I do to *prepare my students* so that they will be better able to learn from my presentation?

   A. Hand out study guide(s) beforehand which include:
      (1) self-evaluation questions.
      (2) an outline of the presentation.
      (3) material difficult to master
   B. Assign readings and activities as homework *before* class which:
      (1) relate homework to the presentation.
      (2) include practice self-quizzes keyed to readings.
      (3) include blanks with prompts.
   C. Provide a glossary of key terms and concepts *before* class.
   D. Use recitation sessions to prepare for presentation.
   E. Prepare classroom climate:
      (1) arrange seating so students can see and hear.
      (2) write agenda/notes on board.
      (3) talk to early arrivals about topic and approach you plan to use.

AT THE START OF MY PRESENTATION

2. What can I do to *capture* my *students' attention*--provoke their curiosity so that they will *want to attend* to what I have to present?
   A. Present an important case which will be solved with new information.
   B. State a strong generalization which contradicts common thought.
   C. Read a powerful quote.
   D. State a series of rhetorical questions that will be answered.
   E. Tell about a difficult to explain action or story.
   F. Make reference to recent news, movies, etc.
   G. Show a demonstration which presents the theme or is difficult to explain.
   H. Introduce puzzling fact(s) which will be understood later.

3. What can I do to *set the stage* for what is to follow?

   A. Summarize previous lectures.
   B. Place presentation in context of course, etc.
   C. Describe your approach; for example, if appropriate, state that a progressive argument will be used.
   D. Define and illustrate all key terms you will be using (even if students are supposed to know them).

4. What can I do to make my presentation *important and meaningful* to students so that they are *motivated to learn*?

   A. State why the material is being presented or explain importance of the topic to their future interests.

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* Adapted, in part, from "Lecture: Detailed Outline." c 1977, Stephen L. Yelon, Learning and Evaluation Service, Michigan State University.

** Not all of the entries above have to be used every time; they represent only some of the possible tactics to use in a lesson. There is one sure way to *fail* using this guide: use it exactly as written. These are suggestions to be adopted and adapted, revised and disguised. Select what you need.

B. Relate presentation content to students' interests, backgrounds, values, beliefs, past, present or future activities.

5. What can I do to help students *focus on what they should be learning*?

A. State the learning *goal* (what students will be *able to do outside of class*).
B. State the learning *objective* (what students will be *able to do at the end of class* with the knowledge gained).
C. State content and form of *exams*; supply sample items.

WHEN DESIGNING THE CONTENT OF MY PRESENTATION

6. What can I do to keep students *organized*?

A. *Present* and *explain outline* of major points of lecture:
(1) state it verbally.
(2) write it on board/overhead projector.
(3) put it in a handout.

7. What can I do to *explain complex* points fully?

A. Use an appropriate vocabulary level.
B. Use a variety of different examples, figures, or illustrations.
C. Include essential content before "nice to know" content.
D. Restate points after examples or illustrations.
E. Demonstrate tasks correctly:
(1) explain what to look for.
(2) show and speak slowly.
(3) precede each move by cues as to what to look for.
(4) ask students to mentally analyze the task.

8. What can I do to make *ideas and examples* more *meaningful* to students?

A. State or demonstrate examples or illustrations that are:
(1) precise; they fit the idea well.
(2) relevant; they fit the context well.
(3) clever.
(4) curious.
(5) novel.
(6) humorous (jokes or cartoons).
(7) intellectual.
B. Relate ideas and examples to:
(1) students' past experiences.
(2) future work or interests.
(3) recent events.
(4) anecdotes.
(5) humorous events.
C. Use varied media to present examples:
(1) films.
(2) demonstrations.
(3) slides.
(4) overheads.

WHEN PRESENTING

9. What can I do to *maintain student interest*?

   A. Include no more than seven major points (chunks of information).
   B. Show where each point fits into the outline as you come to it.
   C. State at least one meaningful example or illustration for each major point.
   D. Maintain eye contact--face audience even at the board.
   E. Use telegraphic notes (read quotes only).
   F. Vary stimuli and mood by changing:
      (1) movement/activity.
      (2) approach (e.g., use dyad or group discussions within a lecture format).
      (3) voice (volume, speed, pitch).
      (4) content (novelty) or pace.
   G. Speak precisely and audibly.

10. What can I do to *minimize distractions*?

   A. Adjust room for physical comfort (e.g., close doors, clean board regularly).
   B. Avoid annoying mannerisms (e.g., unnecessary gestures).
   C. Stay on time.

11. What can I do to let students *know what is coming next*?

   A. Cue students to attend to important points or visuals.
   B. Relate new points to outline/agenda.
   C. Summarize at end of each segment/major point.
   D. State briefly (outline) what's coming in next segment.

12. What can I do to get students *actively involved* in *practicing* the ideas/concepts/principles presented?

   A. Ask students to respond to:
      (1) a problem
      (2) a case
      (3) a question
      (4) an issue
      which is appropriate to the objectives; then *wait* (give students time to think).
   B. Ask students to respond within a set time period by:
      (1) writing responses
      (2) comparing responses in pairs or small groups.
   C. Ask for questions which deal with a *particular* idea; don't ask "any questions?"
   D. Ask questions about each major point, first at a recall level, and then gradually increase to more complex levels--comprehension, analysis, synthesis, application, or evaluation.

13. What can I do to let students know if they're *learning correctly or incorrectly* (without "putting them down")?

   A. Verify students' responses by providing them with the correct answer, some possible correct answers, or characteristics of a correct answer by:
      (1) stating it verbally.
      (2) showing it on board or overhead.
      (3) passing it out on a handout.
      (4) having a student state answer and verifying it.
   B. Recognize correct responses and verbal praise.

C. Prompt wrong responses until a correct answer is obtained by:
   (1) stopping a student (Hold it!)
   (2) describing to a student what he or she is doing.
   (3) asking a diagnostic question.
   (4) eliciting what's wrong.
   (5) explaining the missing idea, if necessary.
   Then allow the student to answer correctly.

WHEN ENDING MY PRESENTATION

14. What can I do to *summarize* the presentation so that it is meaningful to students and *maintains their interest*?

   A. Restate main points (without cueing that it is a summary) by:
      (1) stating a new example.
      (2) asking for the main points.
      (3) showing where we are now.
   B. Refer to next presentation by:
      (1) making a "bridge."
      (2) presenting an attention getter.
      (3) suggesting questions that will be answered (coming attraction).

15. What can I do to make sure students *have learned what I wanted them to learn*?

   A. Present short (10-minute) quiz testing key ideas (objectives).
   B. Ask students to apply concepts at home.
   C. Ask students to do a self-quiz as an assignment.

16. What can I do to *assess my instructional effectiveness*?

   A. Ask for feedback via post-class questionnaire.
   B. Ask for feedback via group discussions.
   C. Inquire as to the cause of any unusual behavior displayed by students (e.g., puzzled expressions, lack of attention, lateness).

VII. ALTERNATIVE CLASSROOM FORMATS

Introduction

This section describes alternative formats--ways of organizing your section or class so as to encourage different kinds of communication patterns, learning, and attitudes. Some of them may sound strange or artificial, which is probably because they are different from what is habitual.

Most of these formats are designed to enhance qualities which are hampered in lecture or discussion situations. We do not believe that these traditional formats are bad, but that they have been over-used without sufficient thought about their effects in relation to desired educational goals. The major qualities* which can be brought out in these alternative formats are:

a. Enhanced feedback from students to instructor about puzzlements and questions concerning the material and their own learning needs.

b. More student-to-student interaction, including discussion and mutual help in which students are able to teach each other.

c. Active rather than passive roles for students in which they participate and take a share of responsibility for directing the learning process.

d. More emphasis on process rather than product in learning, i.e., on students participating in how knowledge is generated in addition to only learning the results.

e. More emphasis on making the material vivid and emotionally real to students, with valid connections to their own life situations and experiences.

f. More opportunity for students to be creative, imaginative, and original in dealing with the material.

g. More activity involving the organization of knowledge: placing it in a systematic framework in which the interrelationships among parts become clear.

The descriptions which follow are detailed enough to convey a general sense of the structure and purpose of each format. In some cases, this will be enough to implement them; however, you as a TA may feel the need for more preparation, through discussion with TA Development Program staff, watching video-taped examples, simulated practice, or reading more materials. The purpose of this section is to provide a "menu" of such possibilities for you to explore.

1. Census-Taking

This consists of raising a question and assessing the total range of student opinion by means of a hand vote, brief statements, or sometimes written comments. A variant involves asking students to discuss briefly among themselves before providing input. The question may refer to subject matter (e.g., "Who thinks this is a major chord?") or procedures (e.g., "How many people would like me to go over point B again?").

Benefits:

This simple technique helps counteract the very common tendency of teachers to make assumptions about "where the class is at" on the basis of one or two student responses (or sometimes none at all, as in "anyone not understand point B?--silence--OK, let's go on"). It asks all students to think, respond, and declare themselves, giving them a more active role and providing the teacher with data in order to direct the next phase of the class.

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* A chart summarizing the functions of each alternative format is presented on page 52.

2. **Laundry List**

Initiate each session by asking students to nominate topics for discussion. This can include problems, confusions, interesting points, extrapolations of basic ideas. Then, go over the list as a group. Combine items, identify those of concern to most students (a straw vote may help to pick those of most concern), and set aside others for another time (e.g., office hours). The first time, encourage everyone to say something so as to make clear that people shouldn't censor themselves out as irrelevant. Deal with every item in some fashion so that all feel their concerns have been recognized.

Benefits:

Enables the TA to have a clear overview of all student concerns, and to choose thoughtfully among them as well as to integrate related questions in a single answer. This gives students input as to the content of the session, providing them with a more active role, and helps weed out idiosyncratic questions that might better be dealt with individually so as not to waste class time.

3. **Brainstorming**

This method works best when you want active participation on an open-ended question where a variety of ideas can contribute to understanding. Discussion is divided into two phases: during the first, we emphasize productivity and quantity of ideas and suspend evaluation. People are encouraged to be spontaneous, to repeat ideas, and include apparently absurd ideas. A visible list is kept of all contributions. During the second phase, the list is sifted, related ideas are combined, and critical judgment is exercised toward a result or solution.

Benefits:

Stimulates widespread student participation, freeing the TA to be encouraging to all while reserving critical judgment for a later time. Stimulates diversity of ideas: why spend twenty minutes arguing over one idea when in the same time we can produce twenty and then discuss them? Also involves students in the process of comparing ideas and applying criteria of validity. Stimulates creativity and originality in areas where there is not one clearly defined right answer.

4. **Do-it-yourself Review Session**

In this variant of brainstorming, ask students; what do *you* think should be on the exam; what do you think are key points in the material? Conduct a brainstorming session for 15 minutes or so, in which you elicit any and all responses, recording them on the board without comment. Then, help students sift the list for convergent points, bad ideas, etc., and provide your own conclusions.

Benefits:

This gets everyone involved in making critical judgments of importance and actively sifting and synthesizing the material. Should enhance participation. Students can also learn from each oher as well as from the TA.

5. **Peer Group Teaching**

Divide a large section into several groups of 3 to 5 students, with a mixture of more and less knowledgeable students in each. Pose them an issue drawn from the "Laundry List," a science problem to solve, or an aspect of the topic at hand. In literature, for example, each subgroup might explore the motivations of a different character, or all might try to identify the major themes of a work. Later on in the class, each group presents its thoughts to the others for discussion. The role of the TA here is to float from group to group, helping with knotty points and generally facilitating discussion. Very often, the group will develop its own leadership as students teach each other.

Benefits:

Much student-to-student interaction, and active participation by almost all. Encourages diversity of ideas among subgroups. Students can learn by teaching others. Students in the class can get to know one another, which enhances participation.

6. **The Learning Cell**

Students are divided into pairs and are given or choose a specific, common assignment for each classroom period. They then read the assignment on their own. Each student then prepares questions relating to the assignment before the next class meeting. Questions should deal with the substantive content of the assignment, applications of the content, or new ideas suggested by the material. The pairs take turns asking each other their series of questions. The instructor should collect carbon copies of the questions and give students some response as to the adequacy of the type of questions they are asking. Exams can be given in the usual manner, but students should be allowed to submit exam items. To help maintain interest, pairs should be rotated periodically.

A variation of this technique is for each student to have read a different assignment. Part of the time is spent with one student explaining what he or she read and then asking the other questions.

Benefits:

Encourages student-to-student interaction and peer teaching. Stimulates students to think actively about the material in the process of formulating questions. Generates a variety of ideas which can later be brought together for the whole class.

7. **Discovery Format**

To use this approach, the instructor sets up a novel, puzzling, interesting situation which students can explore by following their own hunches and intuitions. They are given a theme, a question, or a set of materials, and what they make of it is up to them. The teacher's role is to see that they don't stray too far afield and to give information or suggestions in response to student-initiated questions. The latter should be done sparingly because independent activity is the crucial ingredient in this format.

Some examples:

(a) In a Chemistry class, the TA connected a bulb to a battery in such a way that one wire ran through a container of liquid. This wire was cut so that a liquid conductor was needed to complete the circuit and light the bulb. Students were then invited to try out many liquids, to discover the conductivity of each, and to discuss this in relation to electrical theory. One group became fascinated with mixing liquids, and came up with a "liquid rheostat": They floated a layer of highly conductive liquid on another, weakly conductive liquid, and then moved the wire up and down between the two layers.

(b) There are Music classes in which the main task is to make a group composition using voice or improvised instruments. Students draw on their creativity in developing notation, forming the composition, coordinating the group, and so on, and thus learn about the composition process first-hand.

(c) Philosophy students could use their analytic tools by interviewing non-philosophers about important philosophical issues. They would try to answer such questions as: Does this person have a viewpoint at all on this issue? Does he, perhaps, have in *implicit* viewpoint which can be brought out by thoughtful Socratic questioning? On what assumptions does his attitude seem to rest? Is there a logical sequence involved? How does this person's logic compare with various formal models of logic?

(d) In his book on the teaching of writing, Peter Elbow* suggests stimulating students' intuitions about each other's writing though simile and metaphor: "Talk about the writing as though you were describing *voices*: for example, shouting, whining, whispering, lecturing sternly, droning, etc....Talk about the writing as though you were talking about weather; for example, foggy, sunny, gusty, drizzling, cold, clear, crisp, muggy, and so forth."

Benefits:

Encourages students to explore and trust their own reactions to learning situations, and thus promotes independence. Enables them to be *producers* of knowledge, artistic works, etc., and thus to function like professionals--scientists, composers, and so on. The discovery session, by simplifying the materials, makes this possible even when students have a relatively limited information base to work from.

8. **Role Playing**

Role playing involves a dramatic enactment of some real or imagined situation, in order to endow the characters with vivid, concrete reactions. Given a general situation or character description, the role players improvise dialogue, so that no script is needed. This approach has been used in literature classes, for example, to explore how the characters in a novel might deal with each other in a situation that occurs after the close of the narrative as written. A student's interpretation of "her" character emerges vividly as she puts herself in that individual's place in order to decide what to say next. Steve Allen's television program, "Meeting of the Minds," in which, let's say, Machiavelli, the Empress of China, and Hitler discuss power and politics, is a variant of role-playing. We have held similar, but unscripted debates in Philosophy and Humanities classes.

Benefits:

Helps students make the connection between their own experiences and an initially remote or idealized personage. Encourages them to set aside their own viewpoints and "try on" other ways of viewing the world. Deepens thinking about the implications of an attitude or philosophical stance, and stimulates students to test ideas in active discussion.

9. **Simulations**

These are more elaborate versions of role-playing, with structured rules and game-like arrangements. SIMSOC, for example, simulates an entire society with elements of power, communication, social control, and so on, built into the rules. There is an immense variety of simulations available (see *Serious Games* by Abt in the Reference list). These deal with everything from smuggling in colonial America to family interaction to alternative economic futures. One can also invent one's own, if it is not too complex.

Benefits:

Like role playing, this helps participants enter into different viewpoints and experience the world from a new angle. Participation by all is usually intense. Students deal with the various factors in a situation as an interactive system, not a list; it's like the difference between learning the names and functions of the parts of an engine, and actually tuning it and making it run.

10. **Change-Your-Mind Debate**

To set this up, you pose an either-or type of question--for example, in discussing a recent movie about a wild boy who was brought to civilization; in which environment was he better off? Students who feel clearly one way or another are asked to sit on opposite sides of the room and debate back and forth about the issue. There is a third section, the undecided and uncertain, who may also participate. What makes this different from a traditional debate is that students are encouraged to change

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*See Elbow, Peter, *Writing Without Teachers*, Oxford University Press, 1968.

their minds during the debate; they are instructed to indicate this by moving to the appropriate section of the room so that at all times the seating pattern reflects how people view the issue. Often, the "undecideds" can provide a valuable, more objective perspective on the discussion. Your main job as TA will be to pose fruitful questions and to intervene occasionally if the process bogs down.

Benefits:

Helps students sharpen their viewpoints in opposition, without locking them into positions they don't want to hold. Encourages students to manage their own discussions and support one another on the same side. Encourages active participation.

11. **Comparison and Contrast**

This format is based on the notion that all thinking and conceptualizing is based on comparisons among several entities. Pose for the class a situation in which they are to provide as many answers as possible to the question: "How are two of these alike and different from a third?" or group a larger number into two opposite categories. These can be any kinds of objects or ideas: molecules, novels, people, pieces of music, etc. In a brainstorming mode, list all of these possibilities on the board or ask small groups to list various ways of categorizing the entities involved. Then pool these, discuss, select the most interesting as you will, or compare with formal theories.

Benefits:

This method helps build a bridge between facts or events, and the concepts we use to make sense of the world. It gives practice in this abstracting process and shows that there are always multiple ways of classifying events. Also helps students compare their own perceptions of events and dig more deeply into the subject matter. This also promotes interaction, especially when it includes a small subgroup format.

12. **Open Classroom**

Divide the time and/or space in your section so that different types of activities can go on as needed by students. For example, in a science section one area of the room might have a simple demonstration; another, a group solving problems; and a third, a discussion of theoretical frontiers in the field. You can also set up section time and office hours in a block, and then designate certain times within this for different activities. For example, one time-block could be for catch-up review of material from earlier weeks; another, for help with papers or projects; and still another for those with a high level of interest who want to go beyond what is presented in the course.

Benefits:

The chief benefit of either space or time specialization is that you can concentrate on one thing at a time and don't waste the time of those who would otherwise have to sit through many irrelevant questions before getting to their own. And students with common problems or interests can teach each other more efficiently if the TA is occupied in another area of the classroom. Since each specialized grouping will be smaller than the whole class, you will also have more individualized contact with students even though the time with any group is shorter.

13. **Matching**

This exercise is set up by giving each student a piece of information which requires a *second* information bit in order to make complete sense. Every individual is to find the *one other* person in the room who has the completing information he or she needs. Students are instructed to walk around the room talking to others one-to-one, comparing their information until they find a "match." When they do, they may be additionally asked to discuss their common information in some way. For example: a geology instructor wanted students to learn how to translate from topographical maps--showing an aerial view of mountain terrain--to elevation diagrams showing the same mountains in cross-section. He gave each student one or the other, and asked them to find the person who held a corresponding diagram of the same terrain. In the process, of course, they had to examine a considerable number of

diagrams and thus learned the notation system.

Benefits:

This is a good way to let students get acquainted early in the course. One to one mingling is informal, and having a task takes much of the anxiety out of meeting strangers. It also can convey important information in a lively, game-like atmosphere. And one learns even quite routine information--such as the rules for transposing diagrams--through an active comparative process instead of mechanically.

Instructor Roles

Using these formats requires the instructor to take on new roles. The old tools of lecturing and recitation leading skills will not serve for handling techniques that involve new structures. Some of the new roles are as follows:

a. Encouraging and reflecting. In such activities as brainstorming, for example, the teacher's main function may be to reinforce active participation and to paraphrase or otherwise help the student clarify a thought.

b. Facilitating communication. At other times, when student-to-student interaction is of prime importance, the instructor may serve to help students talk to each other more clearly, through defining points of conflict, encouraging persistence, and so on.

c. Synthesizing and recording. When a group activity is in progress, it may be the instructor who can, with his or her greater grasp of the subject and the group process, see where the discussion is moving and note links among individual contributions. Pointing this out and keeping track (on the blackboard, for example) of what is emerging is an important function.

d. Consulting. At times, for example when small student-led groups are working, the instructor is a consultant who only participates when he or she is specifically asked for help.

e. Process analysis. In such activities as role-playing and simulation, a close examination of what has occured (the sequence of interactions in a role-play and how one led to another, for example) is at the heart of learning from the event. The teacher must be skilled in observing such interconnections and leading students to notice such data for themselves.

f. "Master of Ceremonies." When a complex activity such as a simulation or a change-your-mind debate is in progress, someone must keep track of a set of often-simultaneous events, maintaining coordination and insuring that the activity is moving toward desired goals. This role generally falls to the instructor.

FORMAT	FUNCTION SERVED BY FORMAT: Feedback about learning problems and needs	Student-student interaction; acquaintance and help	Active student roles	Process of knowledge acquisition	Emotional vividness	Creativity and imagination	Organization of knowledge	INSTRUCTOR ROLES NEEDED: Encouraging and reflecting	Facilitating communication	Synthesizing and recording	Consulting	Process analysis	Master of Ceremonies
Census Taking	X		X					X	X	X			
Laundry List	X		X					X	X	X			
Brainstorming	X	X	X			X	X	X	X	X			
Do-it-yourself review	X	X	X				X	X	X	X			
Peer group teaching		X	X	X			X				X		X
Learning cell		X	X	X			X				X		X
Discovery session		X	X	X		X	X	X	X		X	X	X
Role-playing		X	X		X	X			X			X	X
Simulation		X	X		X	X	X		X		X	X	X
Change-your-mind debate		X	X				X	X	X				X
Comparison and contrast		X	X				X	X		X	X		X
Open classroom	X	X	X						X		X		X
Matching		X	X							X	X		X

VIII. GETTING GOOD FEEDBACK ON YOUR TEACHING

Learning to teach well, like any other learning, goes best when you get honest, concrete, constructive information about your impact and how you can improve. Teaching is an active skill, which involves thinking and planning, action, and results. The more knowledge of results you have, the more finely you can adjust your efforts.

A second good reason for getting ample feedback is that it will help you make the class a joint learning enterprise between you and the students. You can share your goals, plan accordingly, and then gauge how well objectives are being accomplished as the course proceeds. This is a second, valuable benefit of building in self-correction as your teaching proceeds.

There are many different channels of feedback, some of which you can implement by yourself and some of which can be facilitated by working with another person or with the Teaching Assistant Development Program. Some possibilities are listed below.

(1) Ask students to fill out the Teaching Activity Profile (see example on page 60) and fill it out yourself. When this is done at or near the beginning of the course, it defines your expectations and sets goals; when done at the end, it is a gauge of progress since mid-quarter. TADP staff will handle data processing for this questionnaire.

(2) Give students a brief questionnaire focused around a specific concern you have. This is usually best done at mid-quarter. Some examples are:

(a) Ask students to check from a large list, those adjectives which best describe how they feel in class (e.g., tense, bored, excited, friendly, etc.). This gives you a feeling for classroom atmosphere.

(b) After a class meeting, ask students to summarize (verbally or in writing) the main points covered; compare this with *your* idea of the central topics. This gives you a check on clarity of communication. (Be sure to emphasize that this is not a quiz.)

(3) Have your class videotaped and go over the results with someone you feel comfortable with--a fellow TA or a member of the TADP staff (or alone if you prefer). The TA Development Program can arrange this.

(4) Invite someone you trust (a friend, a fellow TA, or member of the TADP staff) to visit your class and discuss it with you. Have some questions or points to look for prepared in advance.

(5) Invite someone you trust to talk with your class, after you have left, about how things are going. Arrange that this will be summarized later (without reference to individuals), with special emphasis on improvement suggestions.

(6) Use a questionnaire to find out specifically where students' difficulties lie (e.g., background knowledge, unclarity of lecture, lack of time to put into studying). Use this to plan remedial efforts. (See example on page 67).

(7) Share with your students some of the data you have collected from the above, and hold a discussion on its meaning and how the class can be improved. Reach a "contract" in which all agree to participate in some new way.

(a) Tabulate questionnaire results and discuss them with the class.

(b) Show small segments of a class videotape to the students, and invite discussion of how they felt at the time, their reactions, suggestions, etc.

(8) Ask a few students to meet with you as an informal feedback committee to discuss how to improve the class. One way to do this is by discussing questionnaire data or videotapes.

(9) Write down for yourself the main learning goals you have set (which include subject knowledge and ways of thinking) and ask students to write down what they think they're expected to learn. Compare the two lists and use this as a basis for goal setting and planning.

IX. FURTHER READING

Abt, C. *Serious Games.* N.Y.: Viking Press, 1970.

Presents a rationale for the use of learning games and a number of interesting examples. Suggests formats useful for stimulating creativity, organizing thought, and enhancing student participation.

Axelrod, J. *The University Teacher as Artist.* San Francisco: Jossey-Bass, 1973.

In-depth verbal portraits of how three instructors integrated their personal styles and instructional methods.

Karplus, R., et al. *Science Teaching and the Development of Reasoning.* Berkeley: Univ. of Cal., 1977.

A series of workbooks showing how Piaget's theory of intellectual growth is applied to teaching the natural sciences. The basic method is discovery learning.

Mager, R. *Preparing Instructional Objectives.* Belmont, CA.: Fearon Publishers, 1975.

A concise discussion of behavioral objectives with examples. Especially useful for planning quizzes and exams.

Mann, R., et al. *The College Classroom.* New York: Wiley, 1970.

The results of an intensive research analysis of teaching. Shows the interplay of students' and instructors' personalities, and their effects on such factors as topical emphasis, who is vocal and who is silent, etc.

Mcdonald, F. *Educational Psychology.* (2nd. Ed.) Belmont, CA.: Wadsworth Publishing Co., 1965.

A good general overview of the field of educational psychology. This book integrates research data and presents an even-handed review of various approaches.

McKeachie, W. *Teaching Tips.* N.Y.: Heath, 1969.

An introductory guide for the beginning college instructor. Covers such topics as lecturing, course planning, leading discussions, etc.

Perry, W. *Forms of Intellectual and Ethical Development in the College Years.* N.Y.: Holt, Rinehart & Winston, 1970.

Articulates a pattern of development which may occur in most college students, liberally illustrated with interview material. Suggests that college teaching contributes, cumulatively, to producing this maturation.

Rogers, C. *Freedom to Learn.* Columbus, O.: Merrill, 1969.

Rogers states his position that the student, with his/her learning approach, interests, and rate of development, should be in the center of education; and that students are capable of more self-direction than we credit them with.

Runkel, P., Harrison, R., & Runkel, M. *The Changing College Classroom.* San Francisco: Jossey-Bass, 1970.

A collection of chapters, each discussing a novel format including the innovator's goals, methods, and evaluation of usefulness. Good for expanding your awareness of possible alternatives.

Toffler, A. *Learning for Tomorrow.* N.Y.: Vintage, 1972.

A statement from the author of *Future Shock* about the role of education in preparing humans to cope with a world of rapid change and knowledge turn-over. Raises interesting questions about our basic purposes in teaching.

Sanders, N. *Classroom Questions: What Kind?* N.Y.: Harper & Row,. 1966.

This book develops Bloom's typology of thinking (see Section II of this Handbook), and spells out methods for applying it to questions, assignments, and evaluation of student performance.

X. WHEN STUDENTS NEED ADDITIONAL HELP

If you are receptive to students, they will from time to time bring you various problems and needs that go beyond the role of instructor as strictly defined. Teachers or TA's are often asked to be parents, friends, counselors, shoulders-to-cry-on, and lifelines of various kinds. Sometimes your interest or commitment will lead you to take on these responsibilities, and in other instances you will feel they are beyond your capabilities or your willingness to commit time and energy. Either way, you may have a decision to make about how involved to get, and it can be helpful to know the other sources of help available on this campus.

The Division of Student Affairs is a quite comprehensive source of (free) services to students, including personal counseling, religious counseling, career counseling, legal advice, health services, study skills help, advising for handicapped students, academic program advising, housing listings and others. (These services are available to you, too, as graduate students!)

The services you are most apt to consider referring students to are listed below. *If you are in doubt about whether you should continue helping a student directly or make a referral, a call to the relevant agency to discuss that student's problems may help you to make up your mind. ABOVE ALL* WHEN YOU ENCOUNTER SIGNS OF ANY STUDENT PROBLEM, *LISTEN*! We are all often confused about what the real problem is, and the initially presented problem may be part of a larger one. Learn to hear the student out and ask tactful questions that will encourage further talking without pressure. By not offering a quick solution to what may be the wrong problem, you can do considerable good just by letting the student know he or she is being understood. Getting a full picture of the situation will help you or someone else figure out the most useful kind of help to provide.

RESOURCE SERVICES

1. For information about curriculum requirements and developing an academic program, the student should see the ACADEMIC ADVISOR in his or her college (Revelle, Muir, Third, Warren).

2. For questions like, "I don't know what to major in," "I need to figure out what my interests are," "I thought I wanted to be a ____ but I don't like the subject [or] I'm not as good at it as I thought," students need counseling that will help them assess themselves and make choices. This is available in two places. CAREER PLANNING & PLACEMENT emphasizes information about what you can do with various majors, the requirements and opportunities for graduate programs and job fields. When the question is more mixed with personal feelings and needs, COUNSELING & PSYCHOLOGICAL SERVICES offers "Life-style counseling," including interest testing. When the student so desires, this can be combined with personal counseling or psychotherapy.

3. For students who lack adequate study skills or background in a subject area, OASIS (Office of Academic Support & Information Services) offers tutorial help on an individual basis and also drop-in clinics for many subject areas.

4. If the problem is freezing up on tests, or study blocks which seem due to the student's psychological makeup rather than to academic lacks, workshops on anxiety and stress reduction, motivation problems, and related concerns are offered by COUNSELING & PSYCHOLOGICAL SERVICES. Often such problems are part of a broader personal concern which can be dealt with by general personal counseling, which is also offered (see #5 below).

5. When students come to you with strictly personal concerns, or academic problems that are bogged down in personal concerns (as when parental pressure or a romantic disappointment interfere with studying), COUNSELING & PSYCHOLOGICAL SERVICES offers individual and group counseling which is completely confidential. As this type of referral can be sensitive, you may find it helpful to call a counselor to discuss the problem and get suggestions as to how to bring up the idea with your student.

HOW TO GET IN TOUCH

ACADEMIC ADVISING: Revelle, 452-3490. Located in Revelle Provost's Office
Muir, 452-3580. Located in Muir Provost's Office
Third, 452-4110. Located in Third College Provost's Office
Warren, 452-4350. Located in Warren Provost's Office

CAREER PLANNING & PLACEMENT, 452-3750. Located in 1058 H-L Building, Revelle Campus

OASIS (Academic Support & Instructional Services), 452-3760. Located in Student Center

COUNSELING & PSCHOLOGICAL SERVICES, 452-3755. Located in 1003 H-L Building, Revelle Campus

XI. SAMPLE QUESTIONNAIRES

I. Teaching Activity Profile for Section TA's

II. Teaching Activity Profile for Laboratory TA's

III. Self-Assessment Questionnaire for Students

TEACHING ACTIVITY PROFILE: SECTION T.A.'s

T.A.'s Name _____ Professor _____
(Last) (Full First)

Department _____ Course _____

INSTRUCTIONS FOR RATING SECTION MEETINGS:

The purpose of this questionnaire is to help your T.A. to improve his or her teaching. You can do this by indicating how your T.A. behaves now and how you would like him or her to act.

Please rate each of the items below as to HOW OFTEN THE T.A. ENGAGES IN THE SPECIFIED ACTIVITY. Do not rate in terms of what you think his or her intentions are or how important you think a given activity might be to him or her. DO rate on the basis of what you can see going on in class.

TWO ratings are to be given for each item:

FIRST: Indicate how often the T.A. *actually* behaves in the manner described by placing an "A" (for Actual Behavior) on the line above the appropriate number.

SECOND: Indicate how often you *desire* the T.A. to behave in the manner described by placing a "D" (for Desired Behavior) on the line above the appropriate number.

EXAMPLES

Each question has a rating scale with seven categories on which both ratings are to be made.

(1) In item (a) the student shows that the T.A. sometimes indicates important points to remember, and that the student wants *more* of this activity:

	Very Frequently			Moderately Frequently			Never
(a) The T.A. indicates important points to remember.	7	D 6	5	A 4	3	2	1

(2) In item (b) the student indicates that she would like *less* emphasis on challenging material:

(b) The T.A. brings up challenging material	7	6	A 5	4	D 3	2	1

(3) If your "A" and "D" ratings are identical, please place a single "X" on the appropriate line. Thus, in (c) the student indicates he desires no change in the (small) amount of lecturing currently being done.

(c) The T.A. lectures to the class.

X
7 6 5 4 3 2 1

If the item refers to an activity that is not relevant to the class, then indicate this by placing an "X" on the line above number 1. This indicates that the activity never occurs and that you see no need for it.

Try to avoid leaving blanks unless you are truly unable to make a valid rating.

□

	Very Frequently			Moderately Frequently			Never
THE T.A.:							
1. Encourages students to discuss with each other.	7	6	5	4	3	2	1
2. Explains clearly.	7	6	5	4	3	2	1
3. Provides goals for class sessions.	7	6	5	4	3	2	1
4. Shows a genuine interest in students.	7	6	5	4	3	2	1
5. Helps students relate class material to their personal or "real world" experiences.	7	6	5	4	3	2	1
6. Expresses his or her own opinions.	7	6	5	4	3	2	1
7. Accepts student ideas about how class time should be spent.	7	6	5	4	3	2	1
8. Encourages students to say so when they are puzzled.	7	6	5	4	3	2	1
9. Covers a lot of material in class.	7	6	5	4	3	2	1
10. Will admit a mistake or change his or her mind.	7	6	5	4	3	2	1
11. Builds on students' ideas in class.	7	6	5	4	3	2	1
12. Tells students when he or she thinks they are right.	7	6	5	4	3	2	1

13. Tells students when he or she thinks they are wrong.	7	6	5	4	3	2	1
14. Illustrates material with examples.	7	6	5	4	3	2	1
15. Asks open-ended questions with many possible answers.	7	6	5	4	3	2	1
16. Asks questions that have one definite right answer.	7	6	5	4	3	2	1
17. Helps students master the basics of the subject.	7	6	5	4	3	2	1
18. Explains the thinking behind his or her statements.	7	6	5	4	3	2	1
19. Effectively encourages participation.	7	6	5	4	3	2	1
20. Emphasizes conceptual understanding.	7	6	5	4	3	2	1
21. Brings up challenging material.	7	6	5	4	3	2	1
22. Asks students to clarify or elaborate their points.	7	6	5	4	3	2	1
23. Indicates important points to remember.	7	6	5	4	3	2	1
24. Lectures to the class.	7	6	5	4	3	2	1
25. Comes well prepared.	7	6	5	4	3	2	1
26. Stimulates students' intellectual curiosity.	7	6	5	4	3	2	1
27. Grades fairly and consistently.	7	6	5	4	3	2	1
28. Makes himself or herself available outside class.	7	6	5	4	3	2	1
29. Treats students with respect.	7	6	5	4	3	2	1
	Very Effective			Moderately Effective			Very Ineffective
30. Overall, please rate how effective the T.A. was in helping you learn.	7	6	5	4	3	2	1

TEACHING ACTIVITY PROFILE: LAB T.A.'s

(Instructions are the same as for the Section questionnaires.)

	Very Frequently				Moderately Frequently		Never
THE T.A.:							
1. Helps students to understand the basic facts and terminology.	7	6	5	4	3	2	1
2. Explains clearly.	7	6	5	4	3	2	1
3. Encourages students to ask for help in understanding procedures.	7	6	5	4	3	2	1
4. Shows a genuine interest in students.	7	6	5	4	3	2	1
5. Elicits and/or accepts student input on how the lab is conducted.	7	6	5	4	3	2	1
6. Encourages students to help ea' h other in the lab.	7	6	5	4	3	2	1
7. Helps students learn to evaluate data on their own.	7	6	5	4	3	2	1
8. Praises and rewards good technique, observations, and results.	7	6	5	4	3	2	1
9. Constructively criticizes poor technique, observations, and results.	7	6	5	4	3	2	1
10. Passes on time-saving tips to students.	7	6	5	4	3	2	1
11. Expects very good technique from students.	7	6	5	4	3	2	1
12. Shows students how to fix equipment by themselves.	7	6	5	4	3	2	1
13. Expects students to understand the reasons for the procedures that are used.	7	6	5	4	3	2	1
14. Helps students to understand the anticipated results of experiments.	7	6	5	4	3	2	1
15. Acknowledges when students show him or her a better way to handle procedures.	7	6	5	4	3	2	1
16. Listens attentively to all requests for help.	7	6	5	4	3	2	1

17. Shows how the labs illustrate course material. 7 6 5 4 3 2 1

18. Designates key procedures and likely difficulties before the lab begins. 7 6 5 4 3 2 1

19. Effectively encourages participation. 7 6 5 4 3 2 1

20. Emphasizes conceptual understanding. 7 6 5 4 3 2 1

21. Helps students understand source and analysis of errors. 7 6 5 4 3 2 1

22. Explains the reasons underlying his or her criticisms. 7 6 5 4 3 2 1

23. Indicates important points to remember. 7 6 5 4 3 2 1

24. Admits ignorance when he or she doesn't know something. 7 6 5 4 3 2 1

25. Comes well prepared. 7 6 5 4 3 2 1

26. Stimulates students' intellectual curiosity. 7 6 5 4 3 2 1

27. Grades fairly and consistently. 7 6 5 4 3 2 1

28. Makes himself or herself available outside lab time. 7 6 5 4 3 2 1

29. Lectures to the lab. 7 6 5 4 3 2 1

	Very Effective			Moderately Effective			Very Ineffective
30. Overall, please rate how effective the T.A. was in helping you learn.	7	6	5	4	3	2	1

SELF-ASSESSMENT QUESTIONNAIRE

TO STUDENTS:

As your TA, I'm concerned to help everyone learn and improve their performance. Obviously there has been a range of test grades so far, and one way I can be of more help is to understand specifically what kinds of problems you are having. That's the purpose of this questionnaire, not to put anyone on the spot. Your honest answers will help me teach you better, and I intend to plan our activities in the rest of the course partly on the basis of the information I get from you. If you want to talk to me individually about any of your responses to this questionnaire, please feel free to do so.

1. What is your grade in this course so far? ____

2. How satisfied are you with your level of performance (check one)?

___ I'm doing better than I'd hoped for.

___ I'd like to do somewhat better.

___ I'm pretty much satisfied.

___ I'd like to do a lot better.

3. Please indicate, by circling one response, how strongly each statement below describes your experience in this course so far. (If you aren't doing as well as you want, this may help to pinpoint why.)

Please use the following rating system:

SA = Strongly Agree A = Agree M = Mixed or Undecided

SD = Strongly Disagree D = Disagree

(a) SA A M D SD What we are expected to learn isn't clear.

(b) SA A M D SD The material isn't coming across well in lecture.

(c) SA A M D SD The material isn't coming across well in section.

(d) SA A M D SD The readings, in texts and other material, aren't clear.

(e) SA A M D SD Tests don't reflect what we've been asked to learn.

(f) SA A M D SD My background hasn't prepared me well for the type or or level of material in this course.

(g) SA A M D SD I don't seem to have much aptitude or ability in this subject.

(h) SA A M D SD I'm not very interested in this subject.

(i) SA A M D SD I haven't put in enough time to really learn the material well.

(j) SA A M D SD I'm learning, but what I know doesn't come out in my test performance.

□